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CO-OPERATION
1927

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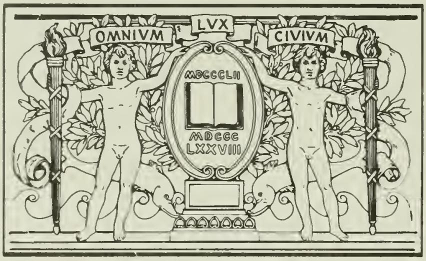

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BOSTON ELEVATED RAILWAY

CO-OPERATION

Index to Volume 6

January to December, 1927

BOSTON PUBLIC LIBRARY

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BOSTON ELEVATED RAILWAY

CO-OPERATION

Volume 6 JANUARY, 1927 Number 1

Boston Elevated Close-Ups

THE TRACK WALKER

(See Page 7)

To All 'L' Employees

IN a recent issue of the Boston Post was an article describing the forebearance of an "El" employee under trying conditions. Here is the story:

Some street car conductors aren't always polite, but this writer met one yesterday who had the patience of Job. He certainly showed that fundamental genius required of a diplomat.

'Twas about 8:30 in the morning, on an in-bound Lake street car. Most any morning at that time, the cars are well filled but on this particular morning and in this particular car, "crowded" didn't begin to describe the situation. But the passengers took it all in good part—all except a girl who wore a chic black felt hat and had a pink flower on her coat.

She got on at Long avenue. Glancing at the crowd, she glared at the conductor and inquired, "Where are all the seats?"

"Sorry, Miss," he replied, touching his cap, "they are all taken this morning."

"Can you imagine that? You'd think they'd run more cars," she declared, turning to another near her. "If the conductor had any brains, he wouldn't allow so many people to get into his car."

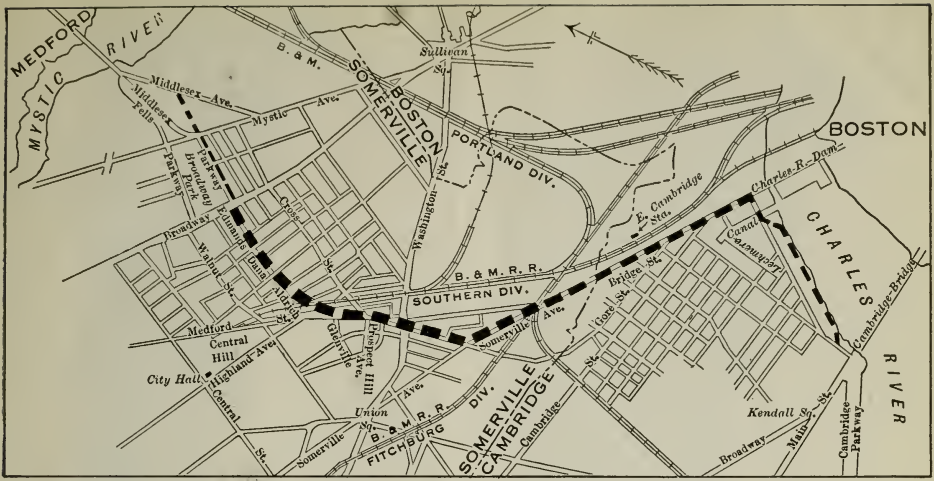
From then on until the car came to the Arlington street station, this young woman kept up an audible comment on the stupidity of the conductor, taking for her audience those who were around her. The conductor was pink behind the ears, but he kept on smiling and doing his work to the accompaniment of the girl's insults. The girl got off with a final verbal jab of "I'll attend to you." The conductor raised his cap and merely replied with a "Good morning, Miss."

Then he turned to the police sergeant standing near by and said, "Well, that's a woman for you. The girl's been riding on my car for three months now. Never had to stand up before. This morning we were late, the car full and she had to stand. One morning in three months and she howls."

Personally, we think Mr. Dana should, in behalf of the Boston Elevated, award the laurel wreath to this conductor.

This incident is related here to show employees that the public appreciates courtesy. It is no detraction from this operator's credit to say that he is typical of a large majority of "El" employees.

Edward Dana



THE NORTHERN ARTERY

THE NORTHERN TRAFFIC ROUTE

This New Artery for Motor Vehicles and Other Traffice in Somerville and Cambridge Has Been Constructed Under Special Act of Legislature

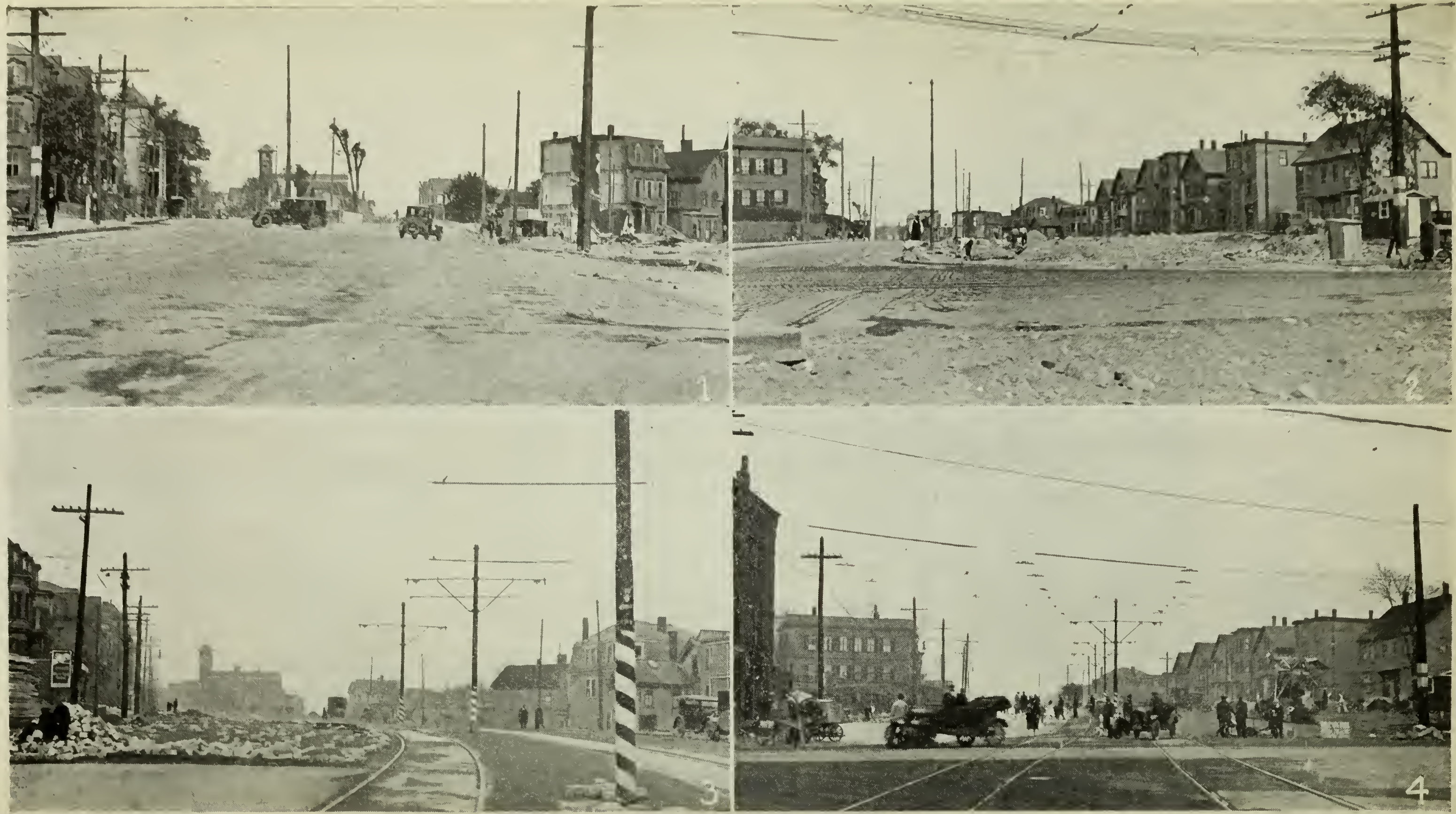
IN 1924 the Massachusetts Legislature passed a bill providing for the construction of a traffic artery from Boston northeastward. It was prescribed in the act that the following route should be followed substantially: Beginning at or near Wellington Bridge in the City of Somerville, thence proceeding over public ways and private property in said city to Medford street and Somerville avenue; thence along Somerville avenue and Bridge street in the City of Cambridge to the Cambridge terminus of the Charles River Dam; thence southerly along the bank of the Charles River Basin to or near the terminus of Memorial Drive in the City of Cambridge near the Cambridge Bridge.

The act also specifies the width of the artery at several points. Middlesex Parkway (formerly Winthrop avenue) in Somerville was to be widened not over 25 feet on the eastern side and the remainder of the new way was to be from 100 to 125 feet wide. A quarter of the cost was to be borne by the State, the balance to be apportioned to the cities benefited in proper proportion. The section along the Charles River Basin from the Charles River Dam to the Memorial Drive will form part of the Metropolitan Park system. The accompanying map shows the details of the route. The cost was estimated at slightly less than $2,500,000.

How the Railway Is Affected

This highway improvement involved an expense of about $250,000 to the Boston Elevated Railway. It was necessary for the railway to re-arrange extensively the track layout leaving and entering Lechmere square at the junction of Somerville avenue and Bridge street, and to rebuild the tracks in their entirety from this point, on Bridge street, Somerville avenue and Medford street to Highland avenue.

The trackwork is all of standard construction, with treated ties, electrically welded rail joints, recut granite block paving with grouted joints, all laid on a con-



"BEFORE AND AFTER" ON THE NORTHERN ARTERY

1 and 3, looking north on Medford St. at Cross St. 2 and 4, looking north on Medford St, from Washington St,
1 and 2, taken Sept. 21, 1926. 3 and 4, taken Dec, 1, 1926

crete base. The track is all double, and the length involved was 15,668 of single-track equivalent, including special trackwork. On old Medford street from Somerville avenue to Highland avenue the rail is 102-pound T-rail; on the remainder it is 122-pound girder rail.

Several extensive pieces of special trackwork were involved in the job, notably the following:

At Somerville avenue and Medford street, a double branchoff and one cross connection.

At Medford avenue and Washington street, a double branchoff, including square crossings.

At Medford avenue and Cross street, a double-wye branchoff and a cross connection.

There was also considerable center-pole construction for the support of the overhead wires, namely, on Bridge street in Cambridge and on Medford street in Somerville.

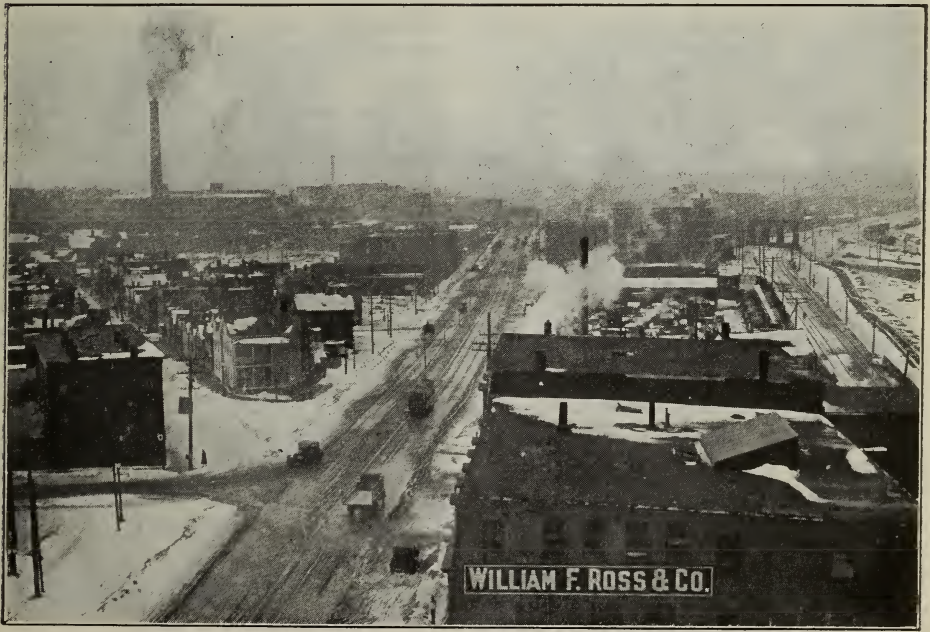
The work involved many special problems, particularly due to the presence of structures belonging to other utilities and the Boston & Maine Railroad. Also it was necessary to keep service going all the time, which was done with the aid of temporary track. There was not a break in the service during the entire period of five months of active construction, from July to December, 1926.

While the northern artery was designed to facilitate motor traffic the railway will benefit in the lessening of traffic congestion which was inevitable with the narrow streets now eliminated.

BUS ROUTE FACTS

A new bus route (No. 3423) was started January 20, running from Watertown Square to the Watertown-Belmont town line via Mt. Auburn, Common, Orchard, Belmont and Sycamore streets. This line will make a quick connection from Watertown to Waverly. It taps a thickly settled residential district of Watertown.

The line operating over the route from Medford Square to the Fellsway and Elm Street via Forest Street (No. 4245) has been discontinued.



VIEW ON BRIDGE STREET SECTION OF NORTHERN ARTERY
(Photograph taken from top floor Boston & Maine Building opposite East Cambridge Station, B. & M. R. R.)

"EL" MACHINE SHOP HANDLED 11752 ORDERS IN 1925

By **RUDOLPH KUNDERT**
Foreman, Machine Shop, Boston Elevated Railway

ANYONE who visits our shop will find that for variety of work it is one of the most interesting shops in this region. To illustrate, let me mention a few preliminary facts. During 1925 we delivered to the Albany Street storeroom 5400 armature bearings, 5700 axle bearings and 4530 journal bearings. These were made from composition products in our foundry at 19 cents a pound. We get orders ranging from the making of a key for a Yale lock to repairs on a 2-ton impeller for a circulating pump. In 1925 we received 11,752 orders.

The work of a machine shop mainly comprises boring, turning, milling, drilling, grinding and bench work, including filing and chipping. In addition there are operations calling for special or single-purpose machines. In our shop we have such a machine, used for broaching or machining the inside of a hole, such as that in a brushholder or the hub of a pulley or gear.

WHAT IS BROACHING?

Broaching consist in drawing a tooth bar of the required shape through the hole. We have cutter bars of "D" shape, square and rectangular bars, and one bar that will cut six keyways in the hub of a pulley.

Brushholders which could not be filed in less than 45 minutes are broached in two minutes or less and a better job is done. The cutter bar is usually from 30 to 36 in. long, and is made tapering, except for the last 2 or 3 in., where it is the exact size of the required shapes. The bar is pulled through the hole rather than pushed, or it would bend and break. This is quicker than broaching by the push method using two or more short broaches.

FOUNDRY WORK

In our shop we handle a large variety of castings of iron, steel, brass, babbitt metal and aluminum. We do the work complete, from the sketch, through the pattern, to the finished product.

In 1925 we delivered

300,585	pounds of steel castings
162,389	pounds of malleable-iron castings
116,986	pounds of plain iron castings
13,040	pounds of gun iron castings
379,380	pounds of composition castings, that is, brass, etc.
12,800	pounds of babbitt-metal castings.

All of this material required some machining before delivery.

WORK ON AIR COMPRESSORS

During 1925 we repaired or overhauled 472 compressors, reaching us in various conditions of disrepair. When they come into the shop they are stripped of coils and armature and immersed in a steam-heated tank of a metal cleaning fluid. This takes off all the grease at a saving of $1.44 each over hand-cleaning.

The compressors are then checked up for requirements, nine out of ten of them needing boring. This requires new pistons and rings. New bearings are supplied and connecting rods are rebabbitted and fitted. The rings are cut from a gun-iron bushing which is turned to within 1/16 in. of the required diameter and split. The rings are placed on a mandrel in sets of three, closed up and turned to the required diameter.

REHABILITATING MOTORS

We are now overhauling the Westinghouse 514 motors. Three-sixteenths of an inch of metal is welded on the axle bearing seats and ends, and also on the axle cap seats. The axle cap seats are then planed to fit new axle caps. We have adopted a chrome nickel steel bolt for holding on the axle caps, which we believe will eliminate the looseness heretofore caused by the stretching of the mild steel bolts. Armature shafts are made from a very tough and strong manganese steel. Last year we turned over 359 of these to the armature shop at an average cost of $17.

SOME FACTS ABOUT TROLLEY WHEELS

We make about 7,000 trolley wheels a year in our brass foundry, and machine these in the following operations:

1. Bore hole through hub for bushing and face one side of the hub.
2. Face other side of hub to proper length.
3. Turn groove in one operation with tool of exact contour of groove.
4. Insert bushing by means of press which gives 2 tons pressure at 70 lb. air pressure.
5. Remove excess graphite and metal to provide free running fit on spindle. This is done with small broach pushed through on above-mentioned press.

SOME FACTS ON JOURNAL BOXES

We put through last year 1100 new and reclaimed journal boxes. These boxes are now made from steel. They are planed on both sides in lots of ten on parallel bars, requiring 13 hours for these operations. Then the tops and faces for the covers are planed in smaller lots on a special fixture arranged to hold them at the proper angle.

MOTOR BEARINGS

Our axle brasses are of the split type, whereas armature bearings are solid.

The axle brasses are first put on a vertical milling machine and the joint faces are machined. They are then bored with a boring bar held on lathe centers. Then they are clamped on a mandrel and the flange is turned and faced on both sides, and the end faced and chamfered. Next they are placed on a special mandrel and the body is turned. Next they are mounted in a jig and drilled for dowel pins. Finally burrs and sharp edges are removed.

Armature bearings are bored, in a special fixture fastened to the lathe carriage, with a boring bar such as is used with the axle bearings. They are then placed on a mandrel and the outside of the body and the flange is turned. A keyway is milled on a vertical milling machine.

ELEVATED CLOSE-UPS

The R. T. L. Trackwalker

(See Illustration on Front Cover)

The rapid transit system comprises 48.354 miles of single track, third-rail system, and 14.377 miles of single track, trolley system, or a total of 62.731 miles of single track. Of this amount, 34.779 miles are on elevated structures and inclines and 27.952 miles are in subways and tunnels.

This mileage is divided into twenty-three trackwalkers' routes, nine of which are in subways and tunnels and fourteen on the elevated structures. The routes vary from 2½ to 3½ miles of single track, according to the amount of special work and special curves in the section, the sections having the greater amount of special work and curves being shorter sections.

To patrol the twenty-three routes or sections of the rapid transit lines requires a force of forty trackwalkers who are supervised by three section foremen.

The tracks in subways and tunnels and on the elevated structure are regularly patrolled during the hours of train and car operation.

On the elevated structure, the track is not regularly patrolled at night by trackwalkers, but is given a superficial inspection, from the time the trackwalkers report off duty until train operation ceases, by the maintainers of the signal and interlocking system. In the event of a report being made by a train crew of any conditions out of the ordinary being observed or felt, a pair of trackwalkers from any of the subway or tunnell sections are notified and an inspection is immediately made.

In the subways and tunnels the trackwalkers work in pairs in order that one may protect the other. On the elevated structure they work alone, as their view is not obstructed by tunnel walls, etc.

Inspection is made by the trackwalkers immediately after reporting for duty and just prior to ceasing work at the end of their trick.

Major repairs are made during the night hours, six nights per week, by crews of men especially trained for this work. Should anything occur during the hours of train operation requiring immediate repairs, such repairs are made by the trackwalkers under the direction of their foremen and additional help is furnished if necessary. When such repairs are made, the work is done between trains and the operation is interfered with little, if any.

The inspection made by the trackwalkers on the elevated structure serves two purposes: first, to make repairs as described above, and second, to locate missing material and make immediate report. When a broken bolt or other fixture is discovered to be missing, all parts are checked up and, if any are missing, search is immediately made to recover the missing parts.

During each shift, the following track equipment is twice inspected:

332,000	feet of track rail
80,000	feet of steel guard rail
256,600	feet of third rail
31,000	rail bonds
373	frogs
295	switches
81,000	joint bolts, including nuts and washers
20,000	guard rail bolts, including nuts and washers
87,000	visible timber bolts.

In addition to their inspection duties, the trackwalkers are required to keep their sections free from rubbish, to grease all guard rails, tighten bolts, etc., and to make such minor repairs as they are able to handle.

FACTS ABOUT PENSIONS

On December 31, 1926, there were 267 individuals on the pension roll and the amount paid for pensions during 1926 was $198,029.12. The average age at which the pensions were granted was 65 years, and the average length of service when pensions were granted was 33 years.

Revenue and Expenses—

1910

	1910	1911	1912
Total Revenue	$15,630,562	$16,404,294	$16,400,085
Railway Operating Expenses:			
†Way and Structures (Mnt.)	1,459,827	1,383.676	1,849,877
Removal of Snow and Ice	113,400	34,340	66,461
† Equipment (Mnt.)	1,063,848	1,044,806	1,306,922
* Power (Oper.)	1,147,913	1,193,354	1,136,979
† Power (Mnt.)	159,592	180,404	180,891
* Transportation (Oper.)	4,495,871	4,337,458	5,448,644
* Traffic (Oper.)	80,238	49,588	22,558
General and miscellaneous	1,747,487	1,594,578	1,900,352
Depreciation	....	....	....
Total	$10,268,176	$9,818,204	$11,912,684
	Per cent of revenue	Per cent of revenue	Per cent of revenue
General and miscellaneous	11.18	9.72	11.59
* Operating	36.62	34.02	40.29
† Maintenance	17.17	15.90	20.35
Removal of Snow and Ice	.72	.21	.41
Operating ratio exclusive of Depr.	65.69	59.85	72.64
Depreciation	....	....	....
Operating ratio including Depr.	....	....	....
Depreciation—% of Depreciable Property	....	....	....

1919

	1919	1920	1921
Total Revenue	$29,498,583	$34,031,636	$33,277,02
Railway Operating Expenses:			
† Way and Structures (Mnt.)	3,721,965	2,593,726	2,683,38
Removal of Snow and Ice	18,550	615,549	63,46
† Equipment (Mnt.)	2.585,720	3,011,850	2,741,35
* Power (Oper.)	2,385,597	3,135,296	2,183,73
† Power (Mnt.)	338,582	468,696	348,76
* Transportation (Oper.)	10,530,882	11,524,823	10,752,38
* Traffic (Oper.)	4,758	3,358	2,40
General and miscellaneous	2,110,285	2,411,824	2,063,57
Depreciation	2,004,000	2,004,000	2,004,00
Total	$23,700,339	$25,769,122	$22,843,05
	Per cent of revenue	Per cent of revenue	Per cent of revenu
General and miscellaneous	7.15	7.09	6.20
* Operating	43.80	43.09	38.88
† Maintenance	22.53	17.85	17.35
Removal of Snow and Ice	.07	1.81	.19
Operating ratio exclusive of Depr.	73.55	69.84	62.62
Depreciation	6.79	5.89	6.02
Operating ratio including Depr.	80.34	75.73	68.64
Depreciation—% of Depreciable Property	....	....	2.93%

*Indicates operating accounts.

†Indicates maintenance acc

ars Ending December 31.

918

1913	1914	1915	1916	1917	1918
17,510,545	$17,910,176	$18,171,655	$19,376,357	$19,818,407	$21,062,693
1,540,548	1,531,835	1,390,311	1,433,870	1,611,097	2,235,018
9,974	94,540	54,153	167.418	87,078	77,914
1,184,073	1,225,511	1,105,723	1,292,899	1,489,863	2,077,699
1,117,762	1,211,790	1,109,113	1,116.077	1,415,782	2,238,737
130.619	150.125	105,856	142,685	146.158	305,629
4,952,320	5,659,147	5,699,670	6,253,508	6,522,360	7,772,434
13,301	8,910	9,921	22,911	6,405	9,167
1,716,718	1,700,976	1,815,990	1,904,754	1,948,381	2,094,829
....	....	142,990	320,000	320,000	1,184,670
$10,665,315	$11,582,834	$11,433,727	$12,654,122	$13,547,124	$17,996,097
Per cent of revenue	Per cent of revenue	Per cent of revenue	Per cent of revenue	Per cent of revenue	Per cent of revenue
9.80	9.50	9.99	9.83	9.83	9.95
34.74	38.41	37.52	38.15	40.09	47.57
16.31	16.22	14.32	14.81	16.38	21.93
.05	.54	.30	.86	.44	37
60.90	64.67	62.13	63.65	66.74	79.82
....	....	.79	1.65	1.61	5.62
....	....	62.92	65.30	68.35	85.44
....	....	....	....	....	....

1926

1922	1923	1924	1925	1926
$32,699,176	$34,096,813	$34,175,320	$34,547,380	$35,481,313
2,611,362	2,955,690	2,836,772	2,865,886	2,764,921
103,291	312,987	112,752	102,010	484,165
2,551,681	2,665,532	3,033,022	2,752,796	3,054,504
2,302,763	2,342,042	1,991,328	1,720,239	1,737,060
357,956	351.889	328,756	266,770	405,515
10,040,832	10,905,933	11,825,235	11,567,233	11,924,518
3,033	3,364	7,866	3,240	6,139
2,113,541	2,588,816	2,590,403	2,631,562	2,857,724
2,004,000	2,004,000	2,496,000	2,496,000	2,841,722
$22,088,459	$24,130,253	$25,222,134	$24,405,736	$26,076,268
Per cent of revenue	Per cent of revenue	Per cent of revenue	Per cent of revenue	Per cent of revenue
6.46	7.59	7.58	7.62	8.05
37.76	38.86	40.45	38.47	38.52
16.88	17.52	18.13	17.04	17.54
.32	.92	.32	.29	1.37
61.42	64.89	66.48	63.42	65.48
6.13	5.88	7.31	7.22	8.01
67.55	70.77	73.79	70.64	73.49
3.06%	2.86%	3.42%	3.39%	‡

‡This figure not yet available.

YOU AND YOUR CAR

More Hints on Safe Car Operation from the National Safety Council—Don't Miss Anything in This Series

IN recent issues of "Co-operation" many excellent suggestions for safe car operation have been printed. The following are from the same source:

LIGHTS

Improperly adjusted headlights are an irritation to the approaching driver and create a positive hazard. Be sure that your headlights are focused properly. There is a focal adjustment on every head lamp. This is usually a screw beside the lead in wires. Different lenses require different focal adjustments. Instructions for adjusting headlights can usually be secured from the Secretary of State or Motor Vehicle Administrator, from the National Automobile Chamber of Commerce, any of the headlight manufacturers, or from the local or national Safety Council.

Headlights should be tilted up or down, as required by the different types of headlight devices. Car vibration easily changes the tilt and focal adjustments; frequent tests and readjustments are necessary.

Always carry a spare bulb for your headlights, the same as you do a spare tire.

The headlight lens may loosen and rotate in the frame; inspect it frequently, adjust and tighten it if necessary.

Reflectors need careful attention.

a. Replace dented reflectors.

b. Replace or replate tarnished or rusted reflectors.

c. Finger prints mar surface of reflector; use soft cloth when handling.

d. When wiping reflector, use soft cloth and wipe from center outward to rim, not round and round. A little lamp black on the cloth will produce good results.

If the lens breaks, tie a transparent paper or cloth over headlight until the lens can be replaced. This will eliminate the glare and protect the reflector.

Spotlights should be installed as high up on the car as practicable. It should be impossible to make the center of the beam of light shine in the eyes of an approaching driver.

STEERING MECHANISM

Drivers should frequently inspect and, if necessary, adjust the steering mechanism. When adjusting, it is best to turn wheels to extreme right. Parts are worn less at this position than when straight ahead. A good adjustment at straight ahead position may bind at the angle position.

The steering column should be solidly anchored to the main frame. The point at which they join receives much of the steering strain and the shock when the front wheels meet obstructions in the road. Loose or broken rivets or bolts at this point are frequent causes of serious accidents.

Parts should not be allowed to wear excessively nor should adjustments be so poor that there is too much lost motion in the steering operation. There should be approximately one-half inch to one inch play (lost motion) on rim of steering wheel.

Proper lubrication of steering mechanism is essential.

Never turn the steering wheel while

(Concluded on page 12)

A 17-YEAR RECORD OF ACCIDENT COSTS

Year Ending June 30	Injuries and damages account	Per cent of gross revenue	Cost per revenue passenger	Cost per car-mile
1910	$834,216.14	5.58	0.2856c	1.59c
1911	778,738.27	4.92	0.2552	1.42
1912	891,059.37	5.39	0.2871	1.63
1913	849,625.95	5.00	0.2603	1.48
1914	834,255.38	4.69	0.2431	1.44
1915	817,581.40	4.57	0.2361	1.41
1916	866,505.68	4.61	0.2383	1.48
1917	931,078.80	4.70	0.2452	1.55
1918	927,373.02	4.76	0.2463	1.66
1919	926,515.47	3.67	0.2796	1.73
1920	764,990.89	2.34	0.2360	1.47
1921	776,407.49	2.27	0.2302	1.52
1922	620,207.73	1.89	0.1780	1.25
1923	840,948.88	2.50	0.2250	1.61
1924	957,998.17	2.79	0.2480	1.71
1925	826,277.81	2.41	0.2229	1.48
1926	940,472.85	2.68	0.2549	1.66

This table explains itself. It is an amplification of the table printed in the August, 1925, issue of "Co-operation."

CO-OPERATIVE BANKS AND HOME-OWNING*

Expert Explains Why Rate of Return Is High, Safety Practically Insured and Money Always Accessible in This Type of Savings Institution. It Helps to Form the Habit of Systematic Saving

ANSLEY M. JOHNSON, treasurer of the Massachusetts Co-operative Bank, was the speaker on co-operative banking before a group of Elevated employees in the course in investing savings on March 22, 1926.

Mr. Johnson said that the first co-operative bank in this state was organized in Boston in 1877, the Pioneer Co-operative Bank, which is still doing business on Bromfield street. Today there are 220 banks in the state, with assets of about $370,000,000. Their popularity is attested by their membership of 440,000, and their service to the community is indicated by the fact that they hold at present 112,000 real estate mortgages.

Up to with five or six years, co-operative banks were permitted to sell only twenty-five shares to a person. Today they can sell forty shares, and hope soon to be able to sell sixty or more. Each share is worth $200 at maturity, in about 12 years, and calls for payment of $1 per month.

MONEY SURELY DOES GROW

To illustrate how money increases, a man, in 1859, placed $200 in a Lowell savings bank. In 1898 he drew out $4,000 and still had $1,000 to his credit. In 1912 he closed the account by withdrawing $1,624. About 12 years ago a prominent business man in town opened a twenty-share account in our bank. He recently drew out $4,053.60, and was surprised at the amount. He asked how it was figured and I explained that he had paid $2,280 in dues and had received $1,173.60 in interest.

One reason for the popularity of co-operative banks is their safety. On this point the commissioner of banks said recently:

"There is no agency or instrumentality in Massachusetts, at least, which accomplishes so much for the working man in assisting him to own his own home on easy terms as the co-operative bank." And he added:

"A man who owns his own home is a better man and a better citizen."

MATURED SHARES ARE POPULAR

Formerly the law required the payment of shares on maturity, which was unfortunate, because some people are apt to spend a sum of money like this without getting a return for it. Shareholders may now keep their money in the bank as long as they wish. The bank also has the privilege of selling partly matured shares as well as paid up shares. Partly matured shares are sold at the current value and the holder receives the same rate of return as if he had subscribed at the beginning of the series. On the other hand the paid up shares are limited to the legal rate of interest, 5 per cent.

The income from co-operative bank shares is tax free, except under certain conditions of surtax. Any one who does not pay a surtax does not pay any tax on co-operative bank incomes.

There is considerable misunderstanding as to the way in which a co-operative bank operates when a mortgagor is not able to keep up the payments on his shares. When a shareholder has paid down his mortgage by a substantial amount, the co-operative bank is willing to close his account and start him over again with a new mortgage and his indebtedness is cancelled in the settlement.

There is no other saving institution in which one can save money as fast as in a co-operative bank. It is systematic saving. There is a fine for belated payments, but shareholders do not like to have fines entered on their books, no matter how trifling the amount.

HELPS IN HOME OWNING

Under the present provision of the law money flows into co-operative banks, sometimes, I think, too fast. Perhaps it may be necessary to restrict the selling of matured shares as is already done by some banks. Mortgages are the only form of investments allowed by a co-operative bank. Hence the co-operative bank is an enthusiastic advocate of home owning. The thing for any one who wishes to own a home to do is to start saving by means of shares until a substantial sum has been laid by. Then the savings can be withdrawn and paid toward a lot, or a house and lot. This becomes the individual's property and the bank will loan enough on the property to complete the payments, taking a mortgage for security. A mortgage may be obtained for as much as 80 per cent of the cost. Shares are taken out to cover the mortgage, which is thus gradually paid off.

It is a bad plan to substitute a straight mortgage for a co-operative bank mortgage, even at a considerably lower annual cost because the systematic saving feature is absent.

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*Fifth in series of talks in the course in Investing Savings, L. J. Dickey, chairman.

Mr. Johnson's Answers to Questions

Following his address, the speaker gave further information in response to inquiries, from which the following have been selected:

Q. What is the difference between paid-up shares and matured shares.

A. Paid-up shares can be bought from the bank at any time for cash just like goods. The matured shares remain in the bank until they have fully matured, when a certificate is delivered. This can be cashed or the money can be left with the bank. Many people take the latter course. Matured shares pay whatever the bank votes to pay, while the rate on paid-up shares is fixed by law at 5 per cent.

Q. What is the difference between a co-operative bank and a building and loan association?

A. The general plan is about the same but, as I understand it, in general the building and loan association have less restrictions. In some cases they take very large mortgages and, I understand, make investments other than in real estate.

Q. Do I understand that the higher rate of interest usually paid by building and loan associations seems higher simply because it is simple interest and not compound interest as in the case of our co-operative banks?

A. I believe that that is true.

Q. How do you make it clear to a co-operative bank shareholder that, say, when he gets a mortgage down to $1,000 from $4,000, but still pays on $4,000, he is not losing somewhere?

A. There is not much argument there, because it is easy to show a person that he is getting 5½ per cent on all the money that he pays in. Every three months, when dividends are declared, the interest is figured on the money paid on principal. Full interest is paid only on the part of the mortgage not covered by cash payments on principal.

Q. Is it true that by comparison with co-operative bank mortgages, savings-bank mortgages are rarely paid off?

A. The latter are very rarely paid off.

Q. Can you give us an example of the difference between the two types of mortgages?

A. Yes; take for illustration a $6,000 loan in each of the two types of banks. With the savings-bank loan, at 6 per cent a year, the interest for twelve years is $4,320 and nothing has been paid on the principal. Thus what you have paid plus what you owe is $10,320. In a co-operative bank the total payments for twelve years for interest, and principal amount to $8,640, or $1,680 less than the other sum.

Q. Is there any loss from withdrawal in a co-operative bank?

A. This is covered by the rules of the particular bank. Some banks charge a part of the earnings against shares withdrawn before maturity, even as much as 25 per cent. The theory, at least for the younger banks, is that it helps defray expenses. In our bank we follow the same practice as the savings bank, figure interest as of last dividend day. So that three months is the greatest amount of interest that anybody can lose.

Q. Isn't there good psychology in penalizing people for withdrawing their shares before maturity?

A. That is the principal excuse for it in my opinion.

Q. Is there much loss to co-operative banks in foreclosing mortgages?

A. I cannot speak from experience because we have never foreclosed a mortgage.

Q. Do I understand that there has never been a failure of a Massachusetts co-operative bank.

A. That is true. Two banks, I believe, were liquidated and taken over by other banks, but there was no loss.

YOU AND YOUR CAR

(Concluded from page 10)

the car is standing still. This puts a severe and unnecessary strain on all steering gear parts and is bad for tires.

It is much easier and safer to steer a car with wheels that "toe in" than one with front wheels that are straight or "toe out." Front wheels toeing in tend to keep the car in the center of the road; little or no effort is required of the driver to keep the car moving in a straight line. Frequent measurements between front wheels should be taken; distance between wheels should be ⅛ in. to ¼ in. smaller at the front than at the back. Take both measurements at a height above the ground equal to the height of the front wheel bearings (half the height of the wheels). Do not measure between tires; measure from a point on inside rim of one wheel to the same point on inside of the other.

IN JARS?

Si—Sarah, is there anything you want from town this mawnin'?

Sarah—You might stop in at one of them there stores and buy some of that there traffic jam I been ahearin' about.—Exchange.

SOME ANALOGIES FROM FOOTBALL*

Some Ingenious Parallels Are Drawn by Experts at This Game, Showing How Success in Business and in Football Can Be Attained by Application of Similar Principles

IN a recent special paper issued by the American Management Association is a vigorous and accurate study of the application of football principles in business. It was prepared by a group of Dartmouth football men under the inspiration of a big game in which they had been victorious. A few of the high points in this paper are these:

It is surprising what similarities are found in the organization and development of a green football squad, and the organization and development of a green squad of labor in a business enterprise. If the prestige of the college or company is good and if it is known as "a good place to work," it will have good material from which to choose.

In striving for supremacy, two competitors, college teams or businesses, may have equally good material to work with, in which case success will depend in part on skill in placement, training, development and morale, and the efficiency of the "executives."

Commenting on the suggestion that co-operation had much to do with the Dartmouth victory, the writers define co-operation as the willingness to work plus the ability to work, and not merely willingness to do one's best. The efficiency and development of the individual depend upon the two banded together. This fact was illustrated by the case of a halfback in a large university, who was improperly placed. He was willing enough, but had few essentials for his position. He probably would have made a great end, but as halfback his ability to co-operate was stunted.

Fairness is another element of success in football and in business. The football organization with autocratic principles is no longer the predominant type, any more than the autocratic business organization.

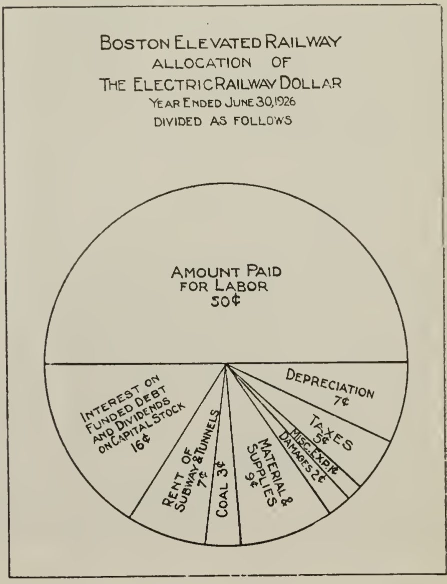
Morale is also an important factor. Entertainment helps to develop this; thus in business, welfare work and recreation produce a valuable "esprit de corps."

But proper selection, and development of morale are only the beginning. The right kind of training is the indispensable asset of successful performances. Football men, like employees in business, are divided into groups according to the positions they are trying for, and specialized coaches take the groups. This is good, although standardization can be carried too far.

Instruction of employees in the best methods is being profitably used in business. It involves, first of all, a study of the job so that sound fundamentals can be worked out which are absolutely essential to the best work. Then it involves a study of the characteristics of the person taking the job. The combination of the two and the development of the best motions in performing work bring satisfactory results.

General education of the workers in business makes alert thinking men who will have confidence in, and are ready to co-operate with the executives. In business it is often possible so to train the workers that when an increase in the personnel of a certain department is desired, men will be ready within the organization.

The authors lay a part of the success of their team to the fact that every man on the field had been "sold" the idea that he was equipped with the best there was, and naturally they all reciprocated with a fine performance. These methods have their corollaries in industry.



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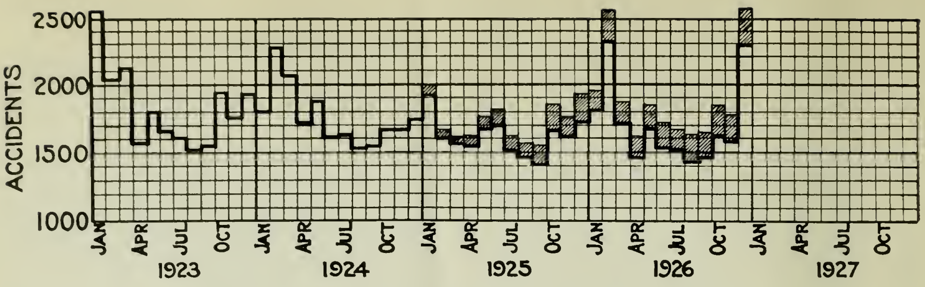
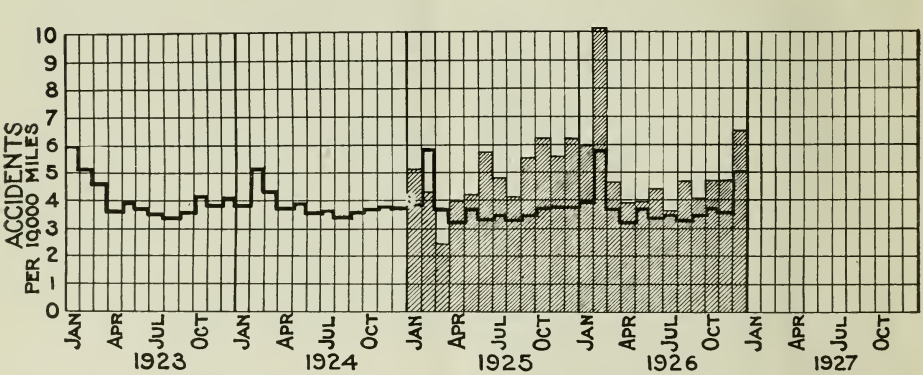


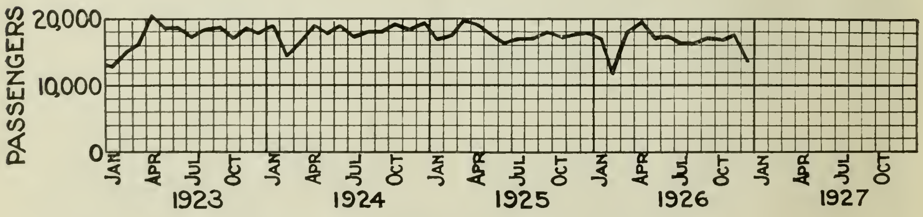
BOSTON ELEVATED ACCIDENTS FOR FOUR YEARS

This diagram contains the data used in the reports which have appeared on the last page of "Co-operation." The lower line shows the car accidents, the upper the total accidents, including buses. So few buses were used before 1923 that the accidents which they caused have been included with the car accidents. The shaded portions of the diagram relate to the bus accidents. In this and the other diagrams space has been left so that the reader can fill in the 1927 figures as he gets them.



THE ACCIDENTS REDUCED TO A MILEAGE BASIS

By dividing the numbers of accidents given above by the mileage (in units of 10,000 for convenience) the data for the second diagram were obtained. The bus record is shown separately, and for ease of reading the bus data are shown by the shaded areas. It will be noted that the bus record for 1926 is better than that for 1925, whereas the car record is substantially the same.



PASSENGERS CARRIED PER ACCIDENT

The data for this diagram were obtained by dividing the total numbers of passengers, month by month, by the accident totals. The record is fairly steady, with seasonal variations, of course; but shows a slight over-all downward tendency. The effect of last February's blizzard is conspicuous.

ALERTNESS CONTEST A SUCCESS

During 1926 the wire and conduits division of the power department conducted a contest for the best record in detecting defects in the overhead. There were twenty line crews in the competition, and awards were made for each monthly record. The winners for the year were T. Fleming and crew. In addition S. Veal and crew, and B. Tansey and crew, of the construction and maintenance force; and E. Beucler and crews were commended for the scores which they made. The superintendent of wires considers the record of trolley breaks for 1926 to be an excellent one, although the actual number of breaks for 1926 exceeded that for 1925.

PENSIONER CONTINUES CO-OPERATION

F. J. Sanderson, an "El" pensioner now living in Orange, Mass., in writing to the general manager recently enclosed the following which he had clipped from an old "farmers' almanac."

The happiest business in the world
Is that of making friends,
And no investment on the street
Pays larger dividends.
For life is more than stocks and bonds,
And love than rate per cent,
And he who gives in friendship's name
Shall reap as he has spent.
Life is the great investment,
And no man lives in vain
Who guards a hundred friendships
As the miser guards his gain.
Then give the world a welcome
Each day whate'er it sends,
And may no mortgage e'er foreclose
The partnership of friends.

DECEMBER SNOW COST 1,135,000 FARES

Details of snow-removal costs for December are given in the following table:

Removing snow	$61,656.76
Hauling snow	20,129.71
Salt for tracks	11,199.12
Tools and miscellaneous snow equipment	8,314.47
Meals	2,675.60
Salt and sand, snow expense on bus routes	1,124.64
Total	$105,100.30

With an average fare of slightly over 9¼ cents per revenue passenger it appears that this snow cost to remove about 110,000 fares every three days.

Some hard-hearted male has reached the conclusion that when a woman motorist holds out her hand it's a signal that she is either going to turn to the right, turn to the left, or stop.—*Reading Pretzel.*

CHRISTMAS DOLLS FOR ORPHANS

The auditing department of the Elevated played Santa Claus to the 150 children in St. Vincent's Orphan Asylum this season. Money was donated by members of the department. With this the girls of the department bought ninety-one dolls, which they dressed, and nearly $30 worth of toys and games. These gifts, with 168 bags of candy and nuts, were sent on the day before Christmas. All of the work in connection with this activity was done by the auditing department, which on Christmas day also supplied the children with ice-cream for their dinner.

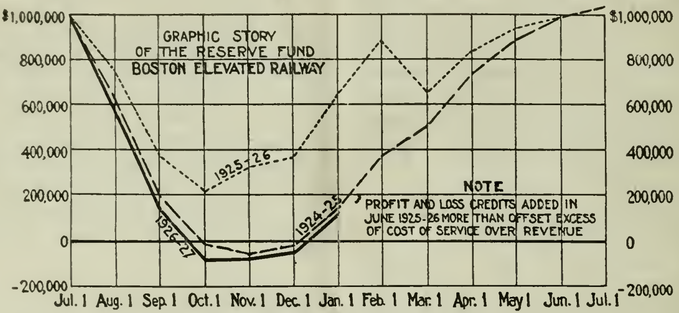
AUDITING DEPARTMENT'S GIFTS TO ORPHANS

CHANGES IN THE RESERVE FUND

Fiscal Year 1925-26 July 1, 1925, $1,000,000				Fiscal Year 1926-27 July 1, 1926, $1,000,000	
July	$249,477.93*	Jan.	$223,301.90†	July	$393,028.41*
Aug.	367,593.94*	Feb.	185,989.63*	Aug.	451,546.79*
Sept.	176,763.97*	Mar.	161,772.65†	Sept.	236,543.80*
Oct.	117,703.96†	April	77,031.69†	Oct.	2,723.19†
Nov.	45,265.00†	May	57,010.06†	Nov.	29.302.22†
Dec.	289,347.71†	June	1,662.18*	Dec.	234,879.91†

Profit and loss credit.....$32,359.07

†Excess of revenue over cost of service. *Excess of cost of service over revenue



DECEMBER OPERATION

GENERAL FINANCIAL DATA	1926	1925
Revenue exceeded cost of service	$234,879.91	$289,347.71
Operating revenue per car-hour (A. E. R. A. std.)	6.52	6.29
Operating revenue per car-mile operated	67.06c	65.49c
Average fare per revenue passenger	9.263c	9.273c
Ratio operating expense to operating revenue	68.94%	66.09%
PASSENGERS CARRIED		
Revenue passengers	35,474,895	34,023,131
Per cent 5c and 6c passengers	17.95%	17.67%
Revenue passengers per car-mile operated	7.026	6.909
OPERATING FACTS		
Trips operated	647,280	640,869
Car-miles operated:		
Rapid-transit lines	1,366,083	1,292,210
Surface, two-man	1,923,811	2,138,559
Surface, one-man	1,296,272	1,186,173
Express, newspaper and sprinkler cars	386	7,444
Motor bus	462,639	300,138
Total miles operated	5,049,191	4,924,524
ACCIDENT DATA		
Accidents per 10,000 car-miles	3.125*	2.25*
Accidents per 10,000 bus-miles	6.48	6.20
Revenue passengers carried per accident	13,670	17,776
Average number of witnesses per accident	3.43	3.25
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	36	18
Employees complained of by car riders	121	92
Car defects reported per 10,000 car-miles	4.3	5.7
INFORMATION ABOUT POWER		
D.c. kw.-hr. output gross for month	29,060,470	27,190,345
Maximum kw. load	83,270	83,190
Tons of coal consumed for power	24,580	22,729
Lbs. of coal for power per d.c. kw.-hr. at cars	2.031	1.958
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	0.856c	0.869c
Per revenue car-mile	5.06c	4.78c
Kw.-hr. per revenue car-mile	5.911	5.492

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*This does not include miscellaneous accidents.

January 26, 1927.

EDWARD DANA, *General Manager.*

BOSTON ELEVATED RAILWAY
CO-OPERATION

Volume 6 FEBRUARY, 1927 Number 2

Boston Elevated Close-Ups

THE LINEMAN
(See Page 21)

To All 'L' Employees:

WITH the beginning of 1926 I suggested that there might well be careful attention given to four elements of success for that year. They were:

Courtesy
Safety
Waste Elimination
Teamwork.

In the editorial on this page in the January issue I reviewed the first of these items in connection with an interesting and typical illustration.

On the subject of safety there is much material for thought in this issue, and I hope also that every employee studied carefully the charts printed last month showing our accident records over a period of years. While the record for 1926 was encouraging, there is opportunity for improvement, particularly in bus accidents. We can better the record in 1927.

The best way to better the record of the past is to make safety an individual matter. No amount of organization and no equipment of safety devices can take the place of personal interest.

A SAFE EMPLOYEE MAKES A SAFE RAILWAY

Edward Dana

NEW MACHINES FOR SNOW FIGHTING ON THE "EL"

Railway Now Has Adequate Equipment for Handling Any Storm Likely to Visit This Region—All Resources Can Be Mobilized Promptly to Push Snow Back from Track and Roadway and to Remove It When Necessary

The Boston Elevated Railway has a large equipment of plows and sweepers for clearing the tracks, which are brought into operation as soon as a snowfall occurs. These are operated by the transportation department.

Due to traffic conditions, that is, the use of automobiles and motor trucks throughout the year, it has become necessary to provide a clear roadway for practically the entire width of the street. To accomplish this, additional apparatus is used, this equipment being in charge of and operated by the maintenance department.

The present article deals with the latter class of equipment. It comprises the following:

Nine snow loaders.
Four trailer cars.
One motor trailer.
Ten tractors, two equipped with brooms.
Three Walter snow fighters.
One 4-wheel-drive truck.
Seven trucks equipped with shears.
Six Differential cars equipped with plows and wings.
Three rail cars equipped with wings.
Thirty-seven shears for installation on trucks hired from contractors.

Representative machines covered in this list are shown in the accompanying illustrations.

The maintenance department apparatus is brought into use as soon as the snow at the ends of plow or sweeper wings reaches a depth of 12 inches. Then motor vehicles, equipped with plows or shears, are used to push it back farther. After the storm other apparatus comes into action to push the snow back to the curb. Where the width of the street will permit this work is done with cars equipped with long steel wings. Of such cars nine are available. Motor vehicles supplement these on very wide streets.

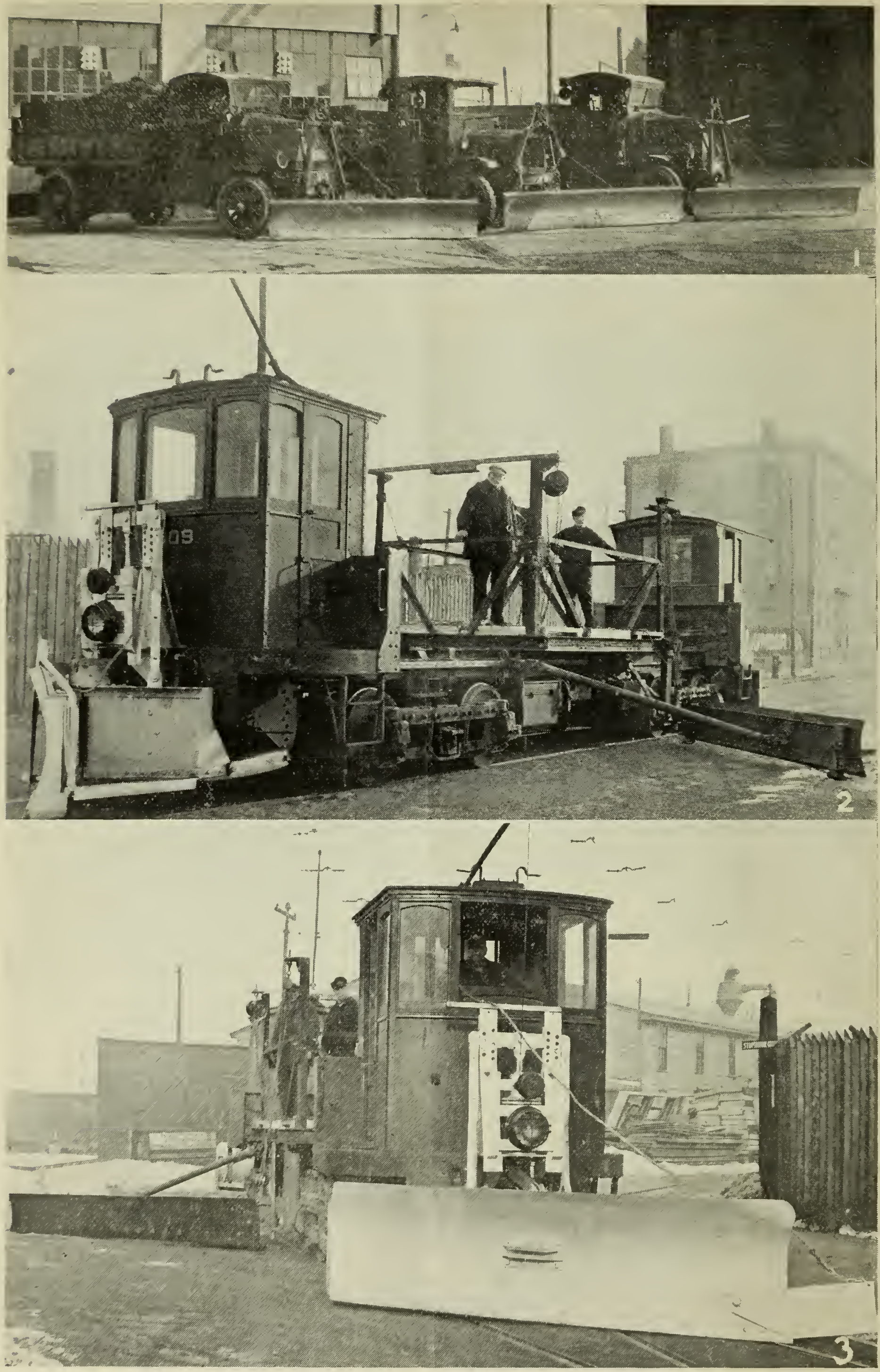
The clearing of the roadway for the full width permits melted snow to reach the gutters which will carry it off provided that gutter catch basins are opened.

During snowstorms when the full equipment of plows and sweepers is in use, seven tractors, three Walter snow fighters, one "F. W. D." truck, and as many additional trucks equipped with shear plows as may be necessary, are in action. In addition, while snow is falling or until streets are open for traffic, up to eleven extra emergency trucks equipped with jacks, block and tackle, towing ropes, picks, shovels, etc., are used to remove disabled vehicles from the tracks.

On bus routes snow must be plowed off practically to the pavement to provide a smooth roadway. For this purpose trucks equipped with shears are used. The Walter snow fighters are particularly useful in this work, because of the scraper between the front and rear wheels, to which pressure can be applied.

Removing Snow

When snow is to be removed, it is pushed into long piles parallel with the curb and is then picked



MAINTENANCE DEPARTMENT SNOW-FIGHTING EQUIPMENT
1, Three out of 44 Champion snow plows; 2 and 3, Differential dump car, body removed, with front and side plows

up and loaded into trucks by Barber-Greene snow loaders. The snow loaders are taken to the locations where they are to be used by means of low trailer cars or motor trailers. The trucks hold on an average seven cubic yards and they can be loaded in one minute. Seven trucks will keep a loader in continuous operation if the dump is not too remote. With well-located dumps a truck will make two round trips per hour. Up to a hundred trucks may be necessary at times.

By means of loaders and trucks the snow which the railway has to remove in an ordinary storm, say of 12 inches fall, can be disposed of in not over 36 hours. During the storms in February, 1926, 130 trucks were used for hauling snow. The railway co-operates closely with the municipalities served, with great advantage to all. Several of these own snow loaders.

ELEVATED CLOSE-UPS

The Lineman

(See Illustration on Front Cover)

The continuity of service and successful operation of this railway is dependent in no small degree on the linemen. It is the linemen and their associates who maintain the overhead trolley and distribution copper which carries the power from power station to the cars. They are the men who get into action to prevent or repair breaks in trolley wire or short-circuits on an overhead feeder or underground cable which may cause interruption to service on some part of the system.

The power distribution system comprises 454 miles of trolley wire, 343 miles overhead feeder and return copper, 713 miles of underground feeder and return cable, 1,105 miles of underground duct, 3,161 manholes and 18,924 poles.

The maintenance force is divided into three groups; the day maintenance crews, the night maintenance crews and the shift crews.

The day crews maintain the trolley lines over which there are 300 cars or less per day; also the overhead and underground feeder lines.

The night crews maintain the trolley lines in the subway and tunnels, and on reservations, and surface trolleys where there are more than 300 cars per day.

There are five stations at which shift crews are located. Linemen are on duty at three of the stations day and night, 365 days in the year, and at the other two stations sixteen hours per day (7 a. m. to 11 p. m.) every day except Sunday.

The system is divided into five districts corresponding in the main to the transportation divisions, with the exception of the City Proper District, which includes all lines from Massachusetts avenue and Southampton street to the water front.

The shift crews respond to all emergency calls for overhead line trouble and defects, defective electric track switches, and surface signals out of order. They also assist the day and night crews on ordinary line maintenance during the hours of light riding.

The overhead trolley lines are inspected and repaired after each 200,000 to 250,000 trolley-wheel passes, for example: Tremont street subway (Arlington incline to Boylston crossover), every ninety-one days; Commonwealth avenue, every twelve months; Tremont street (Dover street to Northampton street), every twenty-three months, etc.

The overhead feeder and return lines in outlying districts are inspected and repaired once a year, and lines on the elevated structure more frequently.

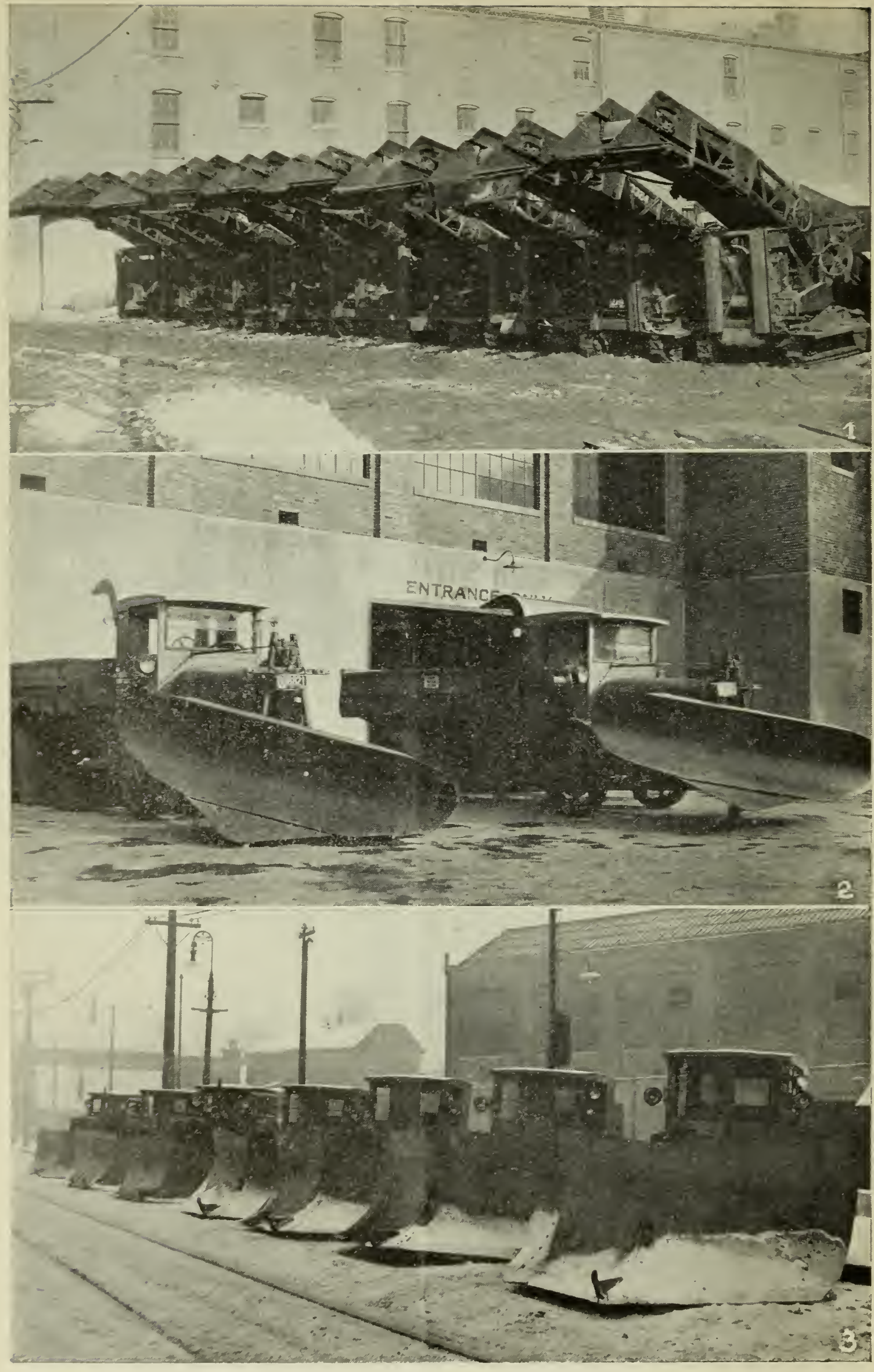
The nature of the work is such that linemen usually work in pairs both on trolley and on feeder lines.

Repairs to trolley wires in the subways and reservations are made from the top of line cars, and repairs to trolley wires over streets, from tower trucks.

Repairs to feeder lines on iron poles and elevated structures are usually made on ladders; and on wood poles by climbing the poles, the poles being stepped.

Trolley inspection and repair includes replacing wornout trolley wire, gaging the trolley wire at each support (gagings are reported on a special form), replacing all wornout ears, frogs, crossovers, section insulators, and all wearing fixtures, replacing corroded supporting wires and broken-down hangers and insulators, putting the trolley wire to proper position over the tracks, etc.

Overhead feeder inspection and repair consists of replacing broken supporting arms, pins, and insulators, taping bare spots on the wire, insulating from trees, repairing line switch-boxes, switches, etc.



MAINTENANCE DEPARTMENT SNOW-FIGHTING EQUIPMENT

1, Nine B.-G. snow loaders; 2, two of three Walter snow fighters; 3, five-ton tractors equipped with V-plows

"SNOW, BEAUTIFUL SNOW, HOW WE LOVE IT"*

By JOHN M. RYAN

Engineer of Surface Lines, Boston Elevated Railway

THE advent of motor transportation, replacing horse-drawn vehicles and sleds, has completely changed traffic conditions on our streets. Likewise the condition in which streets are to be left after heavy snowstorms must necessarily change. No longer can long windrows of snow be left paralleling and close to the car lines to be later leveled off and left to melt away, as was the custom years ago. Snow must be pushed onto the curb line or entirely removed to permit the free movement of the railway's cars and the street traffic in both directions. Streets must be left in a usable condition for car and bus service, or the business of the community will be seriously interfered with, with resulting loss to the railway in revenue, and to business in general. The clearing of snow from streets becomes essentially an emergency proposition that requires prompt action and co-operation between the railway, and the city and town officials.

In 1922 the plowing and removal of snow was divided between the maintenance and operating departments. The engineer of surface lines, aided by the assistant engineer, is in direct charge, under the supervision of the superintendent of maintenance. The maintenance department is responsible for keeping all special work, stations, yards, landings, etc., free from snow during a storm; the manning of, and supervision over all gasoline motor-driven snowplows, tractors, trucks with shears, trucks and snow-loaders, together with rail and service cars equipped with plows and shears; and the cleaning and removal of snow from the streets. These added responsibilities placed on the maintenance department made it necessary to lay out a definite working plan.

In winter the surface lines forces are reduced to the minimum necessary to care for ordinary track maintenance. Therefore we do not have available the man-power required properly to take care of a heavy snow storm; nor was there sufficient snow fighting apparatus on this railway properly to handle the situation that arose last winter. It became necessary to muster in all available men in the entire maintenance department and make them a part of the snow-fighting organization. This was quickly done, and additional snow equipment hastily procured. Today the snow-fighting organization comprises the entire surface-lines division, reinforced by the available men from the whole maintenance department. It is not always possible, owing to the varied conditions over which we have but limited control, that exist during each storm, to have the snow organization function 100 per cent every time, but each storm handled shows improvement. With a definite plan to work to, together with the splendid co-operation that exists among the several divisions of the maintenance department, the ultimate result will be a perfected snow-fighting organization.

As the track-building season draws to a close in the late fall, the division immediately reorganizes for snow work. Snow territories are established, one trackmaster to each territory. These territories are subdivided and competent foremen placed in charge of each subdivision, twenty-four in all. Snow headquarters are established at most important points, with telephone communication to the main office. Three supervisors are each given a territory to cover, one covering East Boston, one the south section of the system, and one the north section. The office of the superintendent of maintenance is kept open continuously from the time the storm starts until all outside night work ceases.

All snow-fighting equipment is assigned to the several snow divisions, and men are assigned to operate it and instructed as to their duties. Thus practically no delay should be experienced either during the day or night in placing in operation the snow-fighting forces and equipment. Every one has his own duties to perform, from the superintendent of maintenance down to the coffee boy.

The snow-fighting equipment owned by the railway and operated by the maintenance department has a value of about $115,000, which does not include the motor trucks of the maintenance department.

The following will give an idea of what can be accomplished in a relatively short period of time with snow equipment:

From Feb. 5 to 24, 1926, eight Barber-Greene snow loaders removed 52,785 cubic yards of snow. The loaders did not work continuously, but a large amount of the work was done on an overtime basis, and it was accomplished approximately 27 per cent cheaper per cubic yard than the average contract price for similar work done elsewhere.

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*Abstracted from address at Maintenance Department Group Conference, E. L. Lockman, chairman, Feb. 1, 1927.

BIG BROTHER SAFETY-COMPOSITION CONTEST

LAST October the general manager, in his radio talk to the Big Brother Club, offered twenty $5 gold pieces as prizes for contributions on safety. His talk was printed in the November, 1926, issue of "Co-operation," page 149. The following are selected from the material sent in, and printed to show "El" employees the children's point of view on this subject:

SAFETY SONGS

By Ben Levy, Chelsea

Little kiddies all should be
Taught these rules of saf-e-ty.

Always look before you run
And be careful in your fun.

Don't cross a street before you look
Or your name will be in the dead kiddies' book.

Don't hook on, or steal a ride
Or Daddy sure will tan your hide.

Now just be good as you should be
And learn this song of saf-e-ty.

Sing a song of safety
We're going to be good
And not run out into the street
Without looking as we should.
We'll not steal rides on trolley cars
Or autos, any more
But always be safe as can be
Now and forever more.

Mary was a little girl
Who always did just right.
She never pulled her sister's curls
Or got into a fight.
One day she said "I'll show these girls
How careful I can be,"
Then she looked both right and left
And crossed the street safely.

BE CAREFUL

By Freda M. Case, Woburn

"Be Careful" is a motto
To follow night and day,
Whether you are working hard
Or only at your play.

Tho' sometimes it is mighty hard,
You'll always be repaid,
And if it is not followed
From life you're sure to fade.

Little children, young and old
"Be Careful" is the best,
And if you don't obey it
You'll always be a pest.

"Be Careful" when you work
And "Be Careful" when you play.
It is the only thing to do
To be safe in every way.

A little girl runs in the street
From the corner an auto comes 'round
Toot! Toot: The auto's very swift.
That girl was never found.

A little fellow, late for school,
Spied a 'lectric car coming his way;
'I'll catch that car there," said the boy
But he never saw school from that day.

Remember, in life, in many ways,
Come temptations great to be faced
And if "Be Careful" you disobey
You'll wish you had been in less haste.

THE SAFETY SIGNAL

By Jack Howard, Wellesley

For warning us 'gainst accidents
The greatest thing is just Good Sense!
Good Sense—that uses eye and ear
'Fore crossing streets, cause danger's near!

Good Sense—that's 'fraid when wires are down
That won't, at bonfires, play the clown.
Good Sense—that stays off thin-iced pools
Where crazy boys would just be fools!

Good Sense—that has too smart a brain
To board, or leave, a moving train!
Good Sense—that at the railroad line
"Stops—Looks—Listens" **every time!**

Good Sense! That's really all it is!
Just knowing how to mind your "biz"!
Keep cool! Watch out! And don't be dense!
For Safety First—is just—Good Sense!

ALWAYS BE CAREFUL

By Doris Thaler, Dorchester

When you cross a street
  Look before you go,
Don't just rush across,
  But don't go slow.

If you rush across,
  At an unwonted speed,
You might fall or trip
  So you should take heed.

If you go too slow
  An auto sure will come,
And you won't be whole
  When you get home.

When you cross a street
  Remember "A. B. C.,"
Which means—"Always Be Careful,"
  It's very simple, see.

Boys, please don't hang on
  A tempting electric car
For if you should fall off
  You'll sure have many a scar.

And then "Always Be Careful,"
  And "Look before you leap,"
By doing so you from yourself
  Will many a sorrow keep.

SAFETY—FIRST, LAST, ALWAYS

By Merle Webberson, Cambridge

Safety, it is our aim
Each day our caution is the same.
When crossing over a car line,
Or else a street—why, then mark time.
Look to the left and to the right,
And if no danger is in sight,
Cross quickly then, no moments spend,
And you will never meet sad end.

SAFETY-FIRST

By Roger Mott Holdsworth, Lynn

Before you start to cross the street
Look south, north, east and west,
And though your feet be very fleet,
Safety first is best.

You may be the swiftest runner
Of your home town school,
But still look up and down the street
For 'tis the safest rule.

Whene'er you start to cross the street,
On the yellow lines please go,
For autos fast are whizzing by,
And we must take care, you know.

Let "Watch the cop" be your motto,
My schoolmates, girls and boys,
If you'd all obey the signals
You'd have sorrows less; more joys.

ALWAYS BE CAREFUL

By Adeline Morrissey, South Walpole

Look both ways,
You won't regret it,
If you don't,
You'll ne'er forget it.

Don't jump off the trolley car,
Wait until it stops.
Look both ways then cross the street,
Watch the traffic cops.

"Stop, Look and Listen," for that sign,
They have placed up high you see.
It means always be careful
And it's meant for you and me.

"WATCH OUT"

By Frances Chisholm, Malden

When the shadows of night are falling,
And the children are through with their play,
How many children are missing,
Whose chairs are vacant to-day?

Just from the fault of not looking,
When crossing the street on their way,
It was only a little misstepping,
But for many it means a delay.

For some 'twas a limb maimed or broken,
While others were mangled and torn,
So badly that death hovered round them,
And their dear ones were sad and forlorn.

So, children, take kindly this warning,
Let this motto be always your guide,
Be sure and take the right crossing,
When bound for the opposite side.

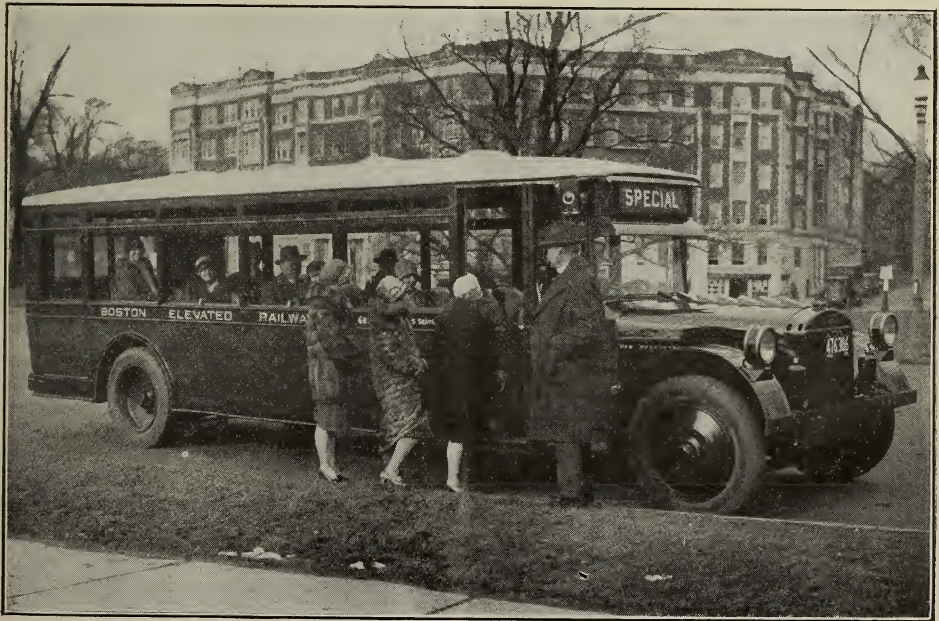
Look up, look down, look before you,
And then I can say without doubt,
You'll avoid all mishaps and great sorrow,
Because you took care to "WATCH OUT."

HOW DO YOU LIKE THIS IDEA?

Peter Witt, inventor of the type of street cars usually known by his name and formerly city traction commissioner in Cleveland, has devised a plan to facilitate mass transportation until such time as rapid-transit lines can be constructed. Mr. Witt suggests that double-deck cars be used, and that the fare be 7 cents on the lower deck and 10 cents on the upper deck. On the latter luxurious Pullman chairs would be installed.

DE LUXE BUS LINE

A de luxe bus has been fitted up for operation on Beacon Street from Coolidge Corner to the business district. It is equipped for comfort, safety and speed. It is probable that in the near future operation on this route will begin, a schedule having been filed with the City Council. It will furnish, at a special fare, a convenient service for business men and shoppers. The appearance of the bus is shown below.



THIS DE LUXE BUS IS INTENDED FOR REGULAR TRIPS BETWEEN RESIDENCE AND BUSINESS SECTIONS

ESSENTIALS OF FARE COLLECTION

The following is a part of a report on collection of revenue prepared by a committee appointed by the general manager, and comprising H. W. Putney, chairman; L. J. Dickey and E. H. Chandler. It is printed in "Co-operation" because, although brief, it gives a comprehensive view of the whole subject

COMPLETE collection of revenue is of vital importance to the car riders, to employees on the cars and at stations, and to the management; to car riders, to give them that adequate service we all desire them to receive; to employees, to supply funds to pay wages and keep in proper condition the accommodations provided for them; and to the management, to permit the maximum service consistent with conditions, and thus assist in obtaining and retaining the good-will of the community.

For the collection of cash fares, registering fare boxes have been installed at all stations and upon all cars. On the cars, fares are collected pay-enter or pay-leave, which relieves conductors and operators from the necessity of going through the car and collecting fares by hand.

Tickets are necessarily collected by hand and are rung up on the ticket register, entered on the day card and turned in with the day's work.

Conductors, operators, gatemen and collectors can insure complete collection of fares by seeing that no passenger goes by the fare box at the time of collection of fare without paying fare as follows:

> Depositing proper cash fare in the fare box,
>
> or tendering proper ticket,
>
> or giving transfer which is good at the point where passenger boards the car, in the direction in which the car is going and at the time it is presented; that is, that the time limit has not expired.

Passes are honored for admission to stations in accordance with the rules, but not upon the cars, except in the case of certain certificates issued to the Department of Public Utilities of the Commonwealth of Massachusetts.

The conductor's or operator's station is so located that he can control fare collection.

Local fares instituted provide in some cases that passenger shall give two tickets, receive a warrant and exchange the warrant for a ticket or return coupon when alighting before passing the zone point.

Conductors and operators cannot be expected to remember at the time passengers leave a car where these same passengers boarded, and for their assistance in this regard a system of warrants has been instituted similar to the check system used by conductors on steam railroads for so many years. This system enables conductors and operators to control absolutely the length of ride taken by passengers on 6-cent tickets.

Free transfers are a prolific source of loss and abuse, and careful attention to the issue and receipt of transfers is absolutely necessary to safeguard the revenues of the railway.

The 10-cent transfer is general in character, is good at any established transfer point, and if car passes a transfer point is issued upon request to any passenger when paying a 10-cent fare, or upon announcement after leaving certain prepayment stations.

The local transfer is special, is punched by the conductor or operator to show the month, day of month, transfer point and direction, and is good only as punched.

The transfer issued from subway and elevated stations is good only when a car is taken at that station for a ride in the direction indicated by the transfer.

All transfers issued by conductors and operators, and practically all those issued from rapid-transit stations, have the hourly coupon form of time limit, and the transfer is good until the expiration of the hour shown by the last coupon left on the transfer.

So far as possible, transfers are issued only to passengers upon request when paying fare or upon announcement immediately after leaving certain rapid-transit stations.

In collecting fares, by scrutinizing transfers offered, conductors, operators, gatemen and collectors can safeguard fare collection. They can usually tell at a glance whether the transfer offered is good on their car. They can easily see whether it is gouged in the proper place for the proper day of the month, and the time limit is shown by the length of the transfer. At places where large numbers of passengers board, conductors and operators announce, "Please have your transfer unfolded."

The Boston Elevated Railway is a transportation salesman and passengers are always given the benefit of the doubt, if there is a doubt, and a suitable explanation is always made to the passenger when refusing to issue or honor a transfer.

It is of special importance in refusing to accept a transfer to tell the passenger why it is not good on the car before the passenger has a chance to ask, and to hand back the transfer to the passenger at that time. This saves many arguments and complaints.

When a passenger insists on riding on an invalid transfer the transfer is accepted under protest, the passenger's name and address is taken, and the matter is reported to the proper official for such action as the circumstances warrant.

In these cases the good conductor or operator uses a higher degree of courtesy toward the passenger than usual, if that is possible, so that the passenger can have no possible compaint to set against the attempt to ride upon an invalid transfer.

It goes without saying, that if the conductor or operator is satisfied that the conductor who issued the transfer made the error, or even if he thinks he may have made it, he accepts the transfer without further comment.

COMPLAINTS OF SERVICE

The letters of complaint about the service which are received at the "El" office are all carefully investigated. Many times the complainants are interviewed and every effort is made to correct conditions which are not satisfactory.

The following table gives the numbers of complaints for the years this record has been kept:

Year	1923	1924	1925	1926
Complaints	239	171	203	189

Everybody in the organization should be doing all within his power to make unnecessary the filing of these complaints.

COLLISION REPAIRS ARE COSTLY

The department of rolling-stock and shops has compiled some interesting figures regarding the cost which is involved in collisions, from the repair standpoint only. The following table shows the thing in a nutshell:

	1923	1924	1925	1926
Cars repaired	263	215	257	230
Cost of repairs	$20,533	$20,816	$36,459	$20,753
Extra cost due to loss of use of cars..........	$26,300	$21,500	$25,700	$23,000
Total cost	$46,833	$42,316	$62,159	$43,753

HOW COULD THE MONEY WASTED IN ACCIDENTS BE USED TO ADVANTAGE?

This question was asked in the examination held last June for the selection of the fourteen men who were sent as delegates to the National Safety Congress in Detroit in October. Following is a brief summary of the answers made by the contestants:

Repay the 1919 loan assessment on cities and towns, the balance of which is $2,305,511.61.

Reduce fares.

Install additional safety appliances to protect patrons and employees.

Have cars repainted and kept in best operative condition.

Maintain present wages and working conditions.

Furnish further relief to employees injured or sick.

Improve the lobbies for the men.

Introduce improvements in carhouses.

Renew worn-out tracks.

Increase the service.

SOME REFLECTIONS ON THE ABOVE SUGGESTIONS

The accident cost for the calendar the 1926 was $925,918.61.

If this expense could be entirely cut out all the improvements suggested could be effected in a comparatively few years.

If half the cost could be eliminated it would amount in fifteen years to a saving of about $7,000,000, from what is now merely waste, in other words money which is practically thrown away.

Many men on the road have a clean accident record. Accidents happen at times when cars are being operated with the utmost care, but the very large majority are due to carelessness and could be avoided.

SERIOUS ACCIDENT AVERTED

On Jan. 19, 1927, Smith Crowe, crossing tender at Saugus Branch railroad crossing, Main Street, Malden, walked to the center of the street with a red lantern when the Boston & Maine crossing tender was lowering the gates. A taxicab driver, disregarding the lowered gates, crashed through them, stopping on the railroad tracks. Mr. Crowe showed presence of mind by signalling the steam train to stop and thus avoided a serious accident.

MOVING AN ELECTRIC CAR

To move an electric car on a level track with good traction and at a moderate speed would require very small motors and would consume a very small amount of power, but ideal conditions do not exist for a street car and it must always have considerable reserve power to move it on up grades and around curves. It must be able to push through snow-covered rails and assist another car when disabled.

To operate its cars, the Boston Elevated Railway owns over 7,000 motors, having a total of over 380,000 horsepower, or sufficient horsepower to run over 4,500,000 fans, or 5,000,000 sewing machines. The armature of each of the motors rotates on an average 88,950,000 times in the course of a year, and the combined rotations to cover the 53,000,000 miles operated make a total of about 165,458,000,000.

The combined weight of these motors is over 13,303,160 lb., or 6,651 tons. In their construction more than 18,000,000 ft. of copper wire was used and about 2,000,000 lb. of copper metal.

In the construction of the core of the armatures, over 1,875,000 sheets of perforated steel were used, from 1-32 to 1-16 in. thick, and it required, to make them, at least 2,709,940 sq. ft. of metal, sufficient to cover a 62-acre farm.

The motors are not connected directly to the axles of wheels, but rotate pinions, which mesh with gears attached to the axle, and the ratio is such that the armature is turning from three to five times faster than the wheels of the car, according to the type of car.

The average person puts 25 per cent of his energy and ability into his work. The world takes off its hat to those who put in more than 50 per cent of their capacity, and stands on its head for those few and far between souls who devote 100 per cent.—*Exchange.*

BOWLING LEAGUE

The final standing of the teams in the Corporation League is as follows:

	Won	Lost	Pin-fall
*Hood Rubber Co.	51	21	26196
*Queen Quality Shoe Co.	50	22	26053
*N. E. Tel. & Tel. Co.	48	24	26556
*Edison El. Ill. Co.	45	27	26295
*Boston Elev. Ry.	43	29	25863
Wm. Filene's Sons Co.	31	42	25418
Un. Shoe Mach. Corp.	30	42	25140
Checker Taxi Co.	23	49	24765
Am. Mut. Lib. Ins. Co.	21	51	25003
Monks & Johnson	18	54	24669

The bowlers in the Elevated team of this league for 1926-27 are: Bunny, Coffey, Davis, Donovan, Downey, Doyle, Foley, James, Lent, McCrystal, J., McCrystal, W., Moulton, Potterton, Richie. Mr. Richie, anchor man on the Elevated team, finished with the second highest individual average.

I AM A FIRM BELIEVER—

In the fates I make for myself.
In the destinies that I determine for myself.
In the good luck of hard work to do.
In the charm of sincerity.
In the stars of hope to which I can hitch wagons.
In the palms that are calloused by honest toil.
In the power of a smile to get business.—*Boston Traveler.*

NO ACCIDENT WEEK

The maintenance department will conduct a campaign for accident reduction from March 7 to 12. The goal is to go through that week without a single accident. The department has issued a call for co-operation as follows:

We ask your help in reducing accidents. This can only be done by being careful.
Inspect your own equipment.
Use no defective tools.
Watch for caution signs.
Look out for the other fellow.
Think and look before you act.
Being careful is easier than being a cripple for life.

PENSIONERS NOW NUMBER 370

On page 7 of last month's "Co-operation" facts were given regarding the pension roll at the end of 1926. Instead of 267 individuals stated as being on the pension roll, the number should have been 362. Since December 31, eleven names have been added to the roll, and three pensioners have died so that the present number is 370.

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*Prize winners.

FACTS ABOUT TROLLEY BREAKS

About 50 per cent of the trolley-wire breaks on this system are fatigue, or crystallization breaks, commonly called vibration breaks. These are caused by the moving up and down of the wire at points of attachment and by vibrations set up in the wire by passing trolley wheels.

Many more of this class of breaks occur during the months of high temperature than during the low temperature months. For example, in June, July and August, 1926, there were thirty-eight breaks of this nature, and in January, February and December there were nineteen breaks. In winter the wire is tight, due to contraction, and in the summer it is slack, due to expansion. This indicates that the tightness of the trolley wire has much to do with the development of crystallization.

Last September dynamometers were furnished each trolley crew, and the trolley wires are now pulled to tensions according to temperature, as follows:

At 0 degrees	2,100 pounds
At 30 degrees	1,800 pounds
At 60 degrees	1,500 pounds
At 90 degrees	1,200 pounds
At 120 degrees	900 pounds

Wire pulled to these tensions will have at zero temperature approximately 3 inches of sag in a 100-feet section and 7¾ inches sag at 120 degrees.

Previous to the use of these instruments the trolley wire was pulled until the men considered it tight, the wire being pulled to the same degree of tightness in winter as in summer, hence wire installed during cold weather was very slack in summer.

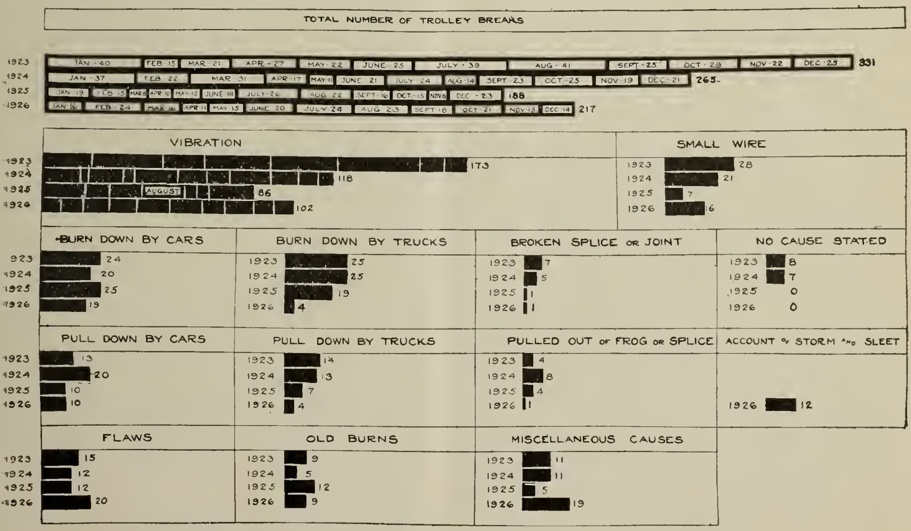
The diagram below gives in convenient form for study and reference the data about trolley breaks over a period of years. It is a revision of the diagram printed early in 1926.

PRONE-PRESSURE METHOD APPLIED

On the morning of Feb. 14, while engaged on snow work in the Sullivan Square yard, Trackman Joseph McGrath sustained a slight electric shock which rendered him unconscious. He had just returned from breakfast and was walking on the elevated structure. Evidently when stepping over the third rail he accidentally caught his toe and, falling forward, seized the pipe rail fence and received the shock. He remembers nothing about the period between catching his toe and recovering consciousness.

Foreman Dennis Hennigan was near the scene of the accident, and he immediately applied the Schaeffer prone-pressure method of resuscitation. He was relieved by Yard Guard T. J. Mace, who continued the application. After a total of ten or twelve minutes Mr. McGrath was sufficiently restored to walk to a hospital ambulance, which had been called in the meantime. Arrived at the hospital he was released at once, returned home and reported for work the same night none the worse for the accident.

The incident furnishes another illustration of the value of knowledge of this method of resuscitation.



TROLLEY-BREAK RECORD FOR FOUR YEARS

COMMON AND PREFERRED STOCKS AS INVESTMENTS*

Speaker in Boston Elevated Course Traces History of These Securities, Explains the Factors Which Determine Their Market Prices and Why "Par Value" Means Nothing in Regard to Stock Values

CONTINUING the series of abstracts of the addresses given in the spring of 1926 in the course in investing savings, there is given below a digest of the one on the above subject delivered by John J. Carey, of Hayden, Stone & Company on March 29.

Mr. Carey said that up to about 1900 virtually the only field for investment in America was in railroad shares and bonds. Few industrial concerns offered their shares to the public for investment and the few that did so gave so little information as to earnings that the public took a gambler's chance in buying most of them.

Even the big companies simply paid their dividends and the people who bought shares did so because they saw evidences of prosperity and expansion in industry.

About 1900 the great industrial development in America caused a grouping of the big industries, and large volumes of preferred and common shares were issued. Preferred shares were generally entitled to 7 per cent accumulative dividends and were issued to owners of competing plants that came into a combine. The common shares in almost every case were admittedly "composed of water." That is they had no tangible assets back of them and represented merely the faith and hope of the promoters that they would be able to pay dividends on the preferred shares and show a good return on the common shares. This idea had been imported from England.

As a result of this the stock market became very active, and in 1901 there were two 3-million share days, a record not equalled for nearly twenty-five years.

The public criticized adversely the creation of large amounts of common shares, usually with a par value of $100, but admittedly water. Actually the shares usually sold far below par. Even the United States Steel Corporation had difficulty in selling its stock at more than $25 or $30 a share for the first three years. In 1904 it was $8 a share. It would have been better if the promoters had admitted that the so-called par value was fictitious and had issued shares of no par value as is done by most new companies today.

Public utilities were sometimes criticized for large capitalization, the supposition being that they would ask the public service commissions for a so-called fair return on such capitalization. What the commissions actually do is to allow a fair return on the investment and not on the capitalization.

The early issues of preferred stocks usually provided for a fixed maximum return, with no chance of sharing in extra prosperity of the company and with a considerable chance of losing if it was not successful. The tendency is now to give the preferred shareholder a chance to share in extra profits, either through conversion privilege of preferred into common or through participation in surplus earnings.

There has been much discussion regarding taxation of stock dividends but the United States Supreme Court has ruled that they are not taxable. The fact is that there is no change in the assets of a company when it splits up its shares. There are simply more shares with a correspondingly smaller equity behind each.

Early corporation reports did not give much information, but there has been a great improvement in this respect, the United States Steel Corporation having been the pioneer in telling investors everything reasonably necessary for them to know about the company. There are still companies which do not give full information, although this is necessary if fair market values are to be assigned to securities.

In reports it is desirable to know about the assets and the earnings, the latter being more important. Some of the old industrials have always been strong on assets. An example is Central Leather, which has $150 or more in value behind each preferred share. It has, however, been a poor earner in spite of its large assets. On the other hand, the Woolworth chain store system came into the market in 1912 with $15,000,000 of tangible assets, and capitalized this amount plus good will at $65,000,000. The company has been such a good earner, however, that stock recently sold at over $200 a share for the 2,600,000 shares outstanding or a total of $520,000,000. This was all accomplished by opening new stores with capital derived from surplus earnings.

It is interesting to note how the war affected certain corporations, due partly to the way in which they handled their finances. The American Locomotive Company and the American Car & Foundry Company for years before the war had been non-dividend payers. During the war they made large profits, much of which they kept in the treasury, and were able to ride through the first post-war depression without difficulty. When the next period of business activity developed they had increased their surpluses and both companies were able to increase their capitalization, giving two shares for one in capital stock. Recently the American Locomotive Company paid $18 on its new stock. The American Car & Foundry is an excellent example of a successful original industrial. It never issued notes, bonds or preferred stock but piled up working capital and finally guaranteed $12 on its common shares. This idea of retaining working capital in a business is important. Henry Ford has said he could tell whether or not his business was profitable by watching the cash items.

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*Sixth in series of talks in course in Investing Savings, L. J. Dickey, chairman.

MR. CAREY'S ANSWERS TO QUESTIONS

Q. Why is it that some companies after becoming prosperous retire their preferred shares?

A. This is sometimes done because preferred shares were issued with too liberal features. Later they called these in. If a company becomes prosperous and can retire a preferred stock this is the best investment in the world. Nothing can be better than for a company to pay its debts.

Q. Why do they not all do this?

A. Some find that they can use their money to better advantage in connection with their operations than by calling in stock, especially if it is callable at a considerable premium.

Q. Why does some stock having a high book value, say United States Steel, sell as low as it does?

A. The public will only pay for a stock on the basis of what they expect to get out of it in dividends. In the eyes of the investor the book value does not have much to do with the market price.

Q. Why did American Telephone & Telegraph hang around 120 for so long although paying $9 a share in dividends?

A. We were in what was called a tight money period at that time. There was also agitation about the government taking over the telephone company. The stock is now selling on the basis of what the investor believes it worth to him, including the issuance of rights from time to time. As the rights are worth about $4 in the normal market and new stock is issued about every two years, the stockholder gets about $11 a share a year.

Q. Why does General Electric sell so high?

A. While it pays only $8 in cash with a special 5 per cent stock dividend, there is no doubt that General Electric earnings are very much larger than would appear from the income reports.

Q. Could the Boston Elevated, if the legislature extends the lease, issue more common stock at par?

A. That is what they hope to do and the stockholders would have the right to subscribe at par. When the company was paying $6 in dividends, the stock was above par. At one time the railway was allowed to issue new stock to stockholders at $155 a share which was too high. The average price paid was $110 a share.

Q. What is the cause of the fluctuation in New Haven stock?

A. A few years ago it looked as though the railroad would go into receivers' hands, but financial interests stepped in and helped to straighten out the situation. The road is now beginning to get into a position where it is financially sound and can show earnings.

A MATERIAL DEBATE

By D. H. WILLETT,
Dept. Accounts

Said the switch to the wire,
"There's a witch in me."
And the wire said to the switch,
"There is ire in me."
"Pooh! Pooh!" said the cable,
"There's able in me."
"Is zat so!" said the tape,
"There is ape in me."
To be honest with all,
I'm stuck on all three.

After an area equal to the combined states of New York, New Jersey, Pennsylvania and all of New England is taken out of the State of Texas, there is still enough land left to make another New York, another Pennsylvania and a State of Delaware, with some left over.

FEWER COMPLAINTS ABOUT EMPLOYEES

The following table shows that the number of complaints about employees which were sent in by patrons was by a slight margin the lowest in eight years, just as last year's record was the best for seven years.

Year	1919	1920	1921	1922	1923	1924	1925	1926
Employees complained of by car riders	1,595	1,529	1,421	1,357	1,243	1,363	1,199	1,185

CHANGES IN THE RESERVE FUND

Fiscal Year 1925-26

July 1, 1925, $1,000,000

July	$249,477.93*	Jan.	$223,30190†
Aug.	367,593.94*	Feb.	185,989.63*
Sept.	176,763.97*	Mar.	161,772.65†
Oct.	117,703.96†	April	77,031.69†
Nov.	45,265.09†	May	57,010.06†
Dec.	289,347.71†	June	1,662.18*

Profit and loss credit....$32,359.07

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	$393,028.41*	Jan.	186,947.50†
Aug.	451,546.79*		
Sept.	236,543.80*		
Oct.	2,723.19†		
Nov.	29,302.22†		
Dec.	234,879.91†		

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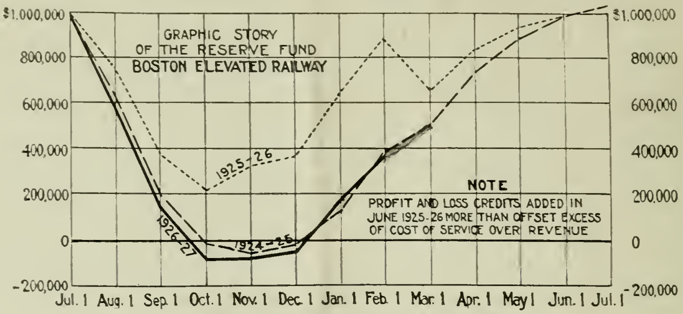
†Excess of revenue over cost of service.

*Excess of cost of service over revenue



JANUARY OPERATION

GENERAL FINANCIAL DATA	1927	1926
Revenue exceeded cost of service	$186,947.50	$223,301.90
Operating revenue per car-hour (A.E.R.A. std.)	$6.27	$6.15
Operating revenue per car-mile operated	64.88c	64.09c
Average fare per revenue passenger	9.212c	9.231c
Ratio operating expense to operating revenue	68.78%	67.17%
PASSENGERS CARRIED		
Revenue passengers	34,160,787	33,144,528
Per cent 5c and 6c passengers	19.09%	18.63%
Revenue passengers per car-mile operated	6.826	6.804
OPERATING FACTS		
Trips operated	642,696	635,193
Car-miles operated:		
Rapid-transit lines	1,319,683	1,258,980
Surface, two-man	1,907,148	2,100,618
Surface, one-man	1,311,297	1,193,843
Express, newspaper and sprinkler cars	387	6,513
Motor bus	465,610	311.407
Total miles operated	5,004,125	4,871,361
ACCIDENT DATA		
Accidents per 10,000 car-miles	2.33*	2.28*
Accidents per 10,000 bus-miles	2.92*	4.56*
Revenue passengers carried per reported accident	16,570	16,893
Average number of witnesses per accident	3.04	3.28
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	37	26
Employees complained of by car riders	128	118
Car defects reported per 10,000 car-miles	5.0	5.5
INFORMATION ABOUT POWER		
D.c. kw.-hr. output gross per month	28,415,500	27,727,680
Maximum kw. load	85,870	85,900
Tons of coal consumed for power	24,095	23,160
Lbs. of coal for power per d.c. kw.-hr. at cars	1.903	1.875
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	0.803c	0.856c
Per revenue car-mile	4.86c	4.87c
Kw.-hr. per revenue car-mile	6.054	5.696

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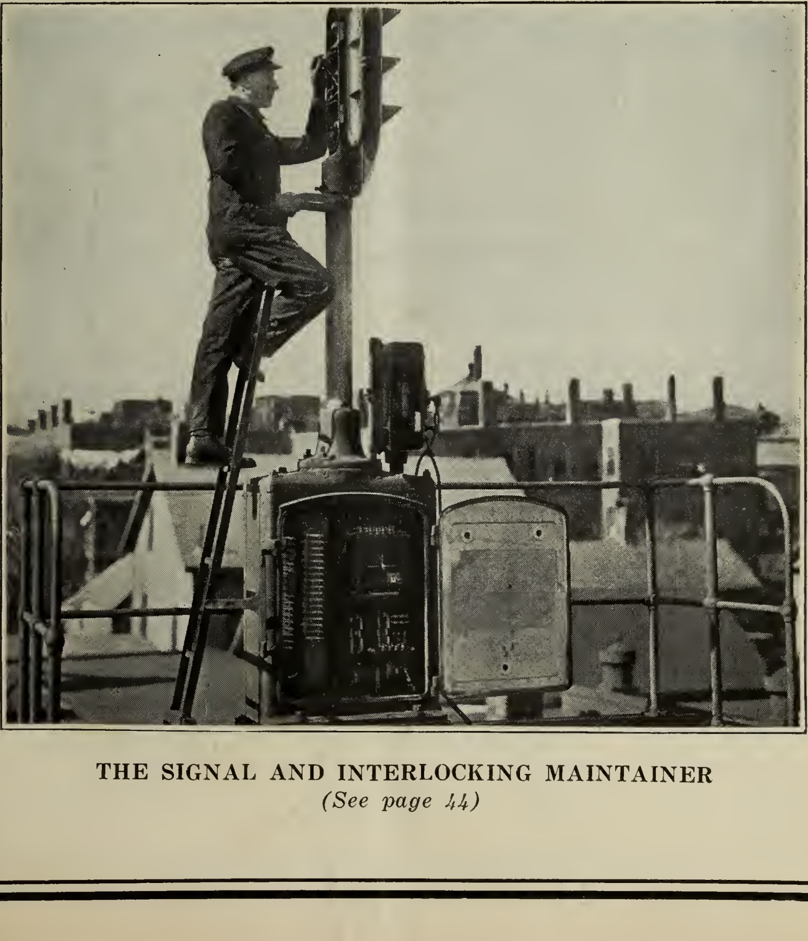
*This does not include miscellaneous accidents or derailments.

February 25, 1927. EDWARD DANA, *General Manager,*

BOSTON ELEVATED RAILWAY
CO-OPERATION

Volume 6 MARCH, 1927 Number 3

Boston Elevated Close-Ups



THE SIGNAL AND INTERLOCKING MAINTAINER
(See page 44)

To All 'El' Employees

"A MAN who dares to waste one hour of time," said Darwin, "has not discovered the value of life."

YOU have heard of late a great deal of talk about conservation of this and that, particularly cutting out waste of material. That is important, in fact vital, but with the vast expenditure for time on the Boston Elevated Railway, it is even more important to save time (or what is the same thing, increase production). It is said of Henry Ford that one element of his success was his realization that "waste elimination means prevention, not recovery—preplanning, not salvaging the breakage."

Let us say in round numbers that our annual time cost is $17,500,000. A saving of only 1 per cent of this would cut costs by $175,000 annually. This is the equivalent of 1,750,000 dime fares.

The way to save 1 per cent is to produce 1 per cent more. There surely isn't a single employee of the railway who cannot do that.

The trouble with all of us is lack of imagination in realizing that time and materials are MONEY—GOLD. If we could see the equivalent of an hour's time in gold dust, or of a sack of cement in gold dust, it would change our attitude entirely.

A PER CENT SAVED A DAY
KEEPS THE DEFICIT AWAY

Edward Dana

ASHMONT STATION—DORCHESTER TUNNEL EXTENSION

This Station on Dorchester Rapid Transit Extension Is Terminal for Interchange of Passengers Between Rapid-Transit Trains, Trolley Cars and Buses

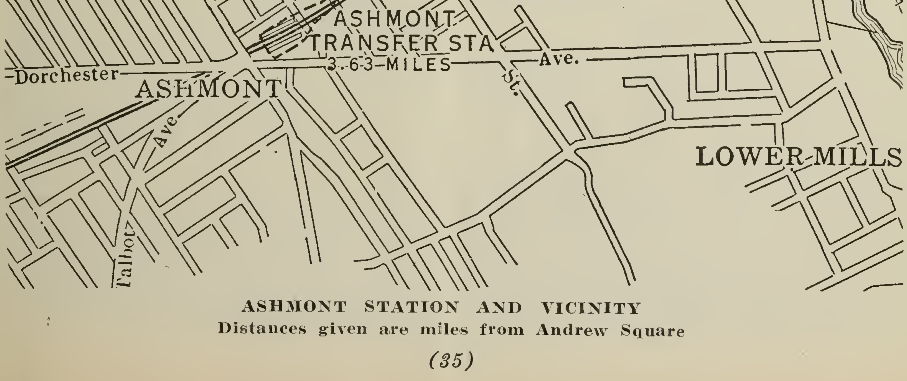
IN the new Ashmont station the rapid-transit platforms are 365 feet long, sufficient for 4-car trains now being operated, and provision has been made for extending these platforms to 435 feet to accommodate 6-car trains.

The inbound or unloading platform for trolley cars will accommodate six cars, and the outbound or loading platforms for trolley cars will accommodate a total of fifteen cars. The bus platform is divided longitudinally; the unloading portion accommodating six buses and the loading portion seven buses.

All inbound trolley cars enter the station either from the high-speed line from Mattapan, from Dorchester Avenue in either direction, or from Talbot Avenue. Thus all cars flow in one direction and they will all unload on the inbound side of the station.

All outbound trolley cars will load on the west side of the station on any of the three tracks, leaving the station either to Mattapan via the high-speed trolley line or proceeding south to Milton, or north intown via Dorchester Avenue, or north to Talbot Avenue.

All buses will enter the station



ASHMONT STATION AND VICINITY
Distances given are miles from Andrew Square

at the south end of the busway, approximately opposite Fuller Street, and will unload on the south portion of the bus platform. Then, after passing the division in the platform, they will again stop to load, leaving the station at the north end of the busway and proceed in the required direction.

The widths of all platforms are ample for the number of persons who will make use of the station.

Fare will be collected at three points, namely:

1. In the headhouse building near Peabody Square, where entrance may be made to either the intown rapid-transit platform, the out-of-town rapid-transit platform, or the out-of-town trolley or bus platforms.
2. From the bus platform. A lobby will be provided where fare will be collected. From the lobby a bridge or gallery leads across the station over the three trolley tracks and the rapid-transit tracks. Stairways on either side of the gallery will be provided to the out-of-town trolley platforms and the rapid-transit platforms.
3. In the dividing fence, between the unloading trolley platform and the in-town rapid-transit platform.

The layout of the station is such that no trolley cars will cross at grade. At either end of the station the trolley cars pass over the rapid-transit tracks.

It is estimated that during the rush hour a total of fifty-eight cars and sixty-eight buses will enter the station.

The cost of the station, exclusive of equipment, but including the real estate which will have to be taken, is $752,000. The equipment will add approximately $106,000, making the total cost of this terminal $858,000.

In the event of the rapid-transit lines being extended to Mattapan, or even further south, at some time in the future, the extension can be made with only minor changes in the station which was designed with this possibility in view.

Even if the rapid-transit lines are extended, Ashmont station will still be a terminal or a transfer station for trolley cars, bus lines, etc., in the Dorchester district.

YOUR DARNED OLD NOSE

If your nose is close
To the grindstone rough,
And you hold it down
There long enough,
In time you'll say
There's no such thing
As brooks that babble
And birds that sing;
These three will all
Your world compose
Just *you*, the *stone* and
Your darned old *nose*.

—*The Merry Thinker.*

NO-ACCIDENT WEEK A SUCCESS

The "no-accident week" conducted by the maintenance department from March 7 to 12 was marred by only two accidents as compared with four for the corresponding week of 1926. For the purpose of stimulating competition the department was divided into fourteen units, as follows: surface lines, road; surface lines, Div. 2; surface lines, Div. 3; surface lines, Div. 4; surface lines, central; R. T. L., road; building; equipment; service cars; signal division; tie and timber; George St. yard; steel erection; welding. All of these were free of accidents for week, excepting "equipment" and "tie and timber," each of which had one minor acicdent. There were 1110 employees this year as compared with 1125 last year, therefore the ratios of employees to accidents were 555 this year and 281 last year.

"AS ITHERS SEE US"

The following comments on our service were clipped from a recent issue of a New York newspaper:

A majority of the spectators came by the delightful and orderly Boston subway, where the crowds were packed in but polite. Visitors from New York stood aghast as the crowd moved mildly into the cars or, if these interesting vehicles were filled to capacity, stepped aside and waited patiently for the next train.

By train, in Boston, is meant a two-car proposition, but in the land of the cod they believe in quantity production in their subways that is lots of trains—and everybody gets there without very much trouble. The lack of football in their rush hours would be sadly missed by New York subway commuters.

Another nice thing about the Boston subway is that the cars are equipped with small chewing gum slot machines, an improvement that has not yet reached the metropolis.

All sorts of helpful advice are accorded the Boston subway riders. One sign says, in effect: "Please be near door when train approaches your station."

"EL" INVESTMENT DOUBLES IN TWENTY YEARS

The chart below shows some of the important facts regarding the Boston Elevated Railway in terms of increase from 1897. The lines from 1897 to 1907 are not shown, but it is obvious that they reach zero in the former year and rise with a fair uniformity to 1907.

Some of the outstanding facts brought out by this chart are:

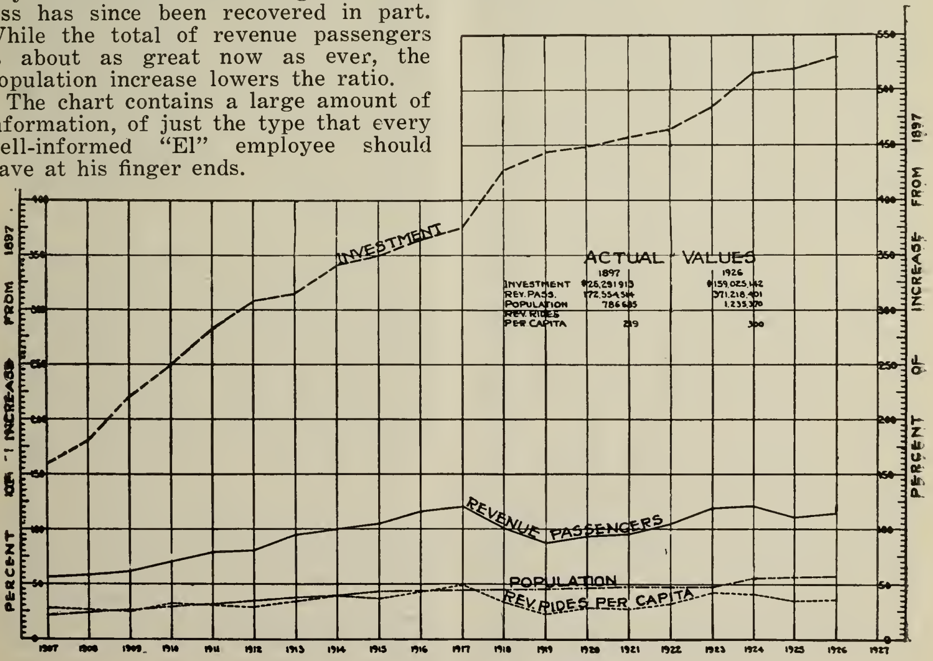
1. At present the investment of about $159,000,000 in the property is roughly 530 per cent greater than that of 1897, which was somewhat over $25,000,000. The investment has on the whole increased steadily, with a rapid increase in 1917-1918, and very slight increases in some years, such as 1912-1913, 1919-1921 and 1924-1925. The average annual investment has been about $4,500,000.

2. Revenue passengers carried have about doubled, but since 1914 the annual total has remained fairly constant. Riding, however, has increased faster than the population.

3. The population is now a little over 50 per cent greater than in 1897, and is still rising, although somewhat slowly at the present time.

4. The relation of riding and population is reflected in the revenue rides per capita, which in 1917 were 50 per cent greater than in 1897. The increase in fare which the trustees found necessary as soon as they took hold of the property resulted in some falling off. This loss has since been recovered in part. While the total of revenue passengers is about as great now as ever, the population increase lowers the ratio.

The chart contains a large amount of information, of just the type that every well-informed "El" employee should have at his finger ends.



SOME PERCENTAGE INCREASES SINCE 1897

BOWLING SCORES
(As of March 25)
BOSTON ELEVATED

	Won	Lost	Pinfall
R. S. & S.	78	18	34364
Division Two	74	22	34261
Rapid Transit	73	23	34485
Repairmen	69	27	33425
Steel Construction	64	32	33726
Sullivan Square	47	49	32810
Division Three	44	52	32134
General Manager	41	55	31470
Receiving	40	56	31650
Division Four	39	57	32295
Division One	34	62	32258
Claim	30	66	32090
Supervisors	25	71	31186
S. B. Power	15	81	31385

MAINTENANCE DEPARTMENT

	Won	Lost	Pinfall
Perron	66	42	34635
Black	65	43	34861
Sprague	65	43	34731
Newman	58	50	34154
Powers	53	55	34750
Butler	53	55	34296
Thomas	51	57	34445
McCann	48	60	34285
McCrystal	46	62	33920
Kivell	36	72	33105

SUMMER TRAINING CAMPS

Applications are being received for places in the United States Army summer training camps, of which there are fifty-three throughout the country. The term is 30 days and all necessary expenses, including transportation, are paid by the government. Information can be secured from the Army Information Service, 39 Whitehall Street, New York City.

SAFE POSITION FOR ALIGHTING PASSENGER

For some months past a series of articles has been running in "Co-operation" giving extracts from answers to examination questions relating to safety. Last fall fourteen car and train service men were sent to the National Safety Congress in recognition of the merit of their answers to questions. Among the questions was this:

What do you consider to be a "safe position" for an alighting passenger to be in before you give the starting signal?

Some of the replies to this question are given below:

"Clear of car by at least 2 feet; and on a curve, free from swing of car."

"About 2 feet from step of car on a straight track and about six feet on a curve."

"Away from car so that no part of car interferes with person or clothing of passenger."

"On alighting see if there are any passing automobiles or trucks and warn passengers of any possible danger."

"When passenger was off car and was facing the door or was walking toward sidewalk."

"On the sidewalk if possible; if not, a position of safety where there is no chance of being hit by any vehicle."

"Be sure the passenger is safely off the car onto the street; and sometimes if a cripple, see that they are on the sidewalk safely and in good hands."

"On the street far enough away from car that they will be clear of all possible sway of car due to curves or other track construction."

"Away from and absolutely clear of car doors; if aged to see that they are safely to the sidewalk; and if a lady with children, safely on sidewalk."

"When his clothing will not be caught or the car interfere with him in any way, and doors are closed. Beware of rear-end swing. Open doors with due regard for following autos."

"Well clear of car and to make sure that his or her clothes are not caught on door. If old, blind or cripples, I would not consider them safe until on sidewalk."

"Far enough away from car so that their bodies or clothing could not possibly be touched by any part of the car; if on curve, far enough away that the end of car would not swing and hit them."

"It is necessary for a passenger to be at least 6 feet from car, for many are nervous and would often lean back and if car was in motion would probably be knocked down and seriously injured; again on a curve it is necessary to allow passenger to walk a few yards to escape the swing of the car."

"Alighting passengers should be at least two feet from car and free from approaching vehicles. At all times special care should be given to the weak, to passengers not having the full use of their limbs and also women and children."

"When I am absolutely sure there is no danger of anyone getting hurt, or any clothing or flowing garment being caught by any part of car. Also warn passengers to look out for vehicles, which may be approaching, and by waiting, if necessary, until passenger reaches the sidewalk."

"Where there is little traffic, after they have stepped clear of car and doors are closed. Where there is a lot of congestion and passengers are inclined to get nervous, give them a chance to steady themselves before starting as they may unconsciously step back in path of car. At points such as Dudley or North Station give passengers a chance to get clear of overhang of car."

"A 'safe position' varies at different stops. Where a car is about to make a left hand turn, care should be exercised so that passengers will not be struck by swing of car. In wet or slippery weather, by allowing passengers to get a considerable distance from car, a serious accident may be avoided. People sometimes lose their footing and may slide several feet where pavement is icy or slippery. If car is standing there it is a point of great aid to persons and conductors also."

YOU AND YOUR CAR

In recent issues of "Co-operation" a series of articles has been running under the above caption. The material was prepared by the National Safety Council of which the Boston Elevated Railway is a member. Below are a few additional paragraphs on the subject of:

The Motorist and the Pedestrian

Sixty-five to 85 per cent of all persons injured or killed in automobile accidents are pedestrians. There should be, however, no general conflict between "pedestrians" and "motorists" because all of us are pedestrians at times and most of us are motorists at times. Each must respect the other's rights. The reckless or inconsiderate motorist and the "dareyou-to-hit-me pedestrian are each a menace to others as well as themselves.

Pedestrians have rights on the streets; so have automobiles and other vehicles. Because some pedestrians use the streets carelessly and incautiously, there is no excuse for the drivers of motor vehicles not taking every precaution to avoid injuring pedestrians. The law is usually on the side of the pedestrian and properly so, for he is usually the chief sufferer.

Automobile drivers must be especially careful to avoid injuring pedestrians who cross the street at the middle of the block.

Many accidents happen at regular crossings. If pedestrians do not or will not pay attention to your horn, remember that some people are deaf while others are mentally deficient, and that hundreds of people are using the streets whose old age, youth, infirmities, and physical defects would throw all the responsibility of an accident upon you.

Be especially careful when two or more people are crossing the street together. Quite often before an approaching automobile one person may stop and one go on, or they may go in opposite directions.

Above all, do not unnecessarily or suddenly squawk your horn. Pedestrians may be easily frightened and temporarily "paralyzed."

Drivers should stop 10 feet behind street cars which have stopped to load or unload passengers. In some cities where there are safety zones automobiles are permitted to pass standing cars if they do so slowly.

People who have just alighted from a trolley car are sometimes bewildered and do not know which way to go. Give them plenty of time to get their bearings before attempting to pass them.

Regardless of who you think is at fault, if your car injures or kills some other person, you are usually held responsible. Juries are inclined to be sympathetic and to favor the pedestrian.

Moreover, no matter who was to blame, and in spite of large sums of money paid for "damages," the dead cannot be brought to life, nor could anything or anybody console you in case the one killed happened to be your wife, your child, or some one else near and dear to you.

There are over 25,000,000 telephones in the world and over three-fifths of these are installed in the United States, there being one telephone for every seven people in the United States while in the other countries combined there is but one for every 185 inhabitants.

DID YOU EVER SEE A SERVICE CHART?

The cut in the center of this issue of "Co-operation" shows the total traffic on the South Huntington Avenue line at its maximum load point, at Huntington and Massachusetts Avenues, throughout the day, in both directions.

The passengers for each half-hour, and for each fifteen minutes in the rush hours, are shown by heavy lines. The seats for these same periods are shown by the continuous vertical line. The overload for the rush hours is shown by the light dotted stepped line.

As a car runs from the terminus back to its original starting terminus and provides seats over the entire distance, the use of which is, of course, less than at the maximum load point, it does not take much imagination to appreciate the number of vacant seat-miles actually operated.

If we analyze one of the rush hour periods, say the outbound period from 5 to 6 P. M., we find that the individual cars may at times have a greater overload than the overload for the period considered, which shows that the problem is one of distribution.

Traffic Count, 5 to 6 P. M.—Outbound

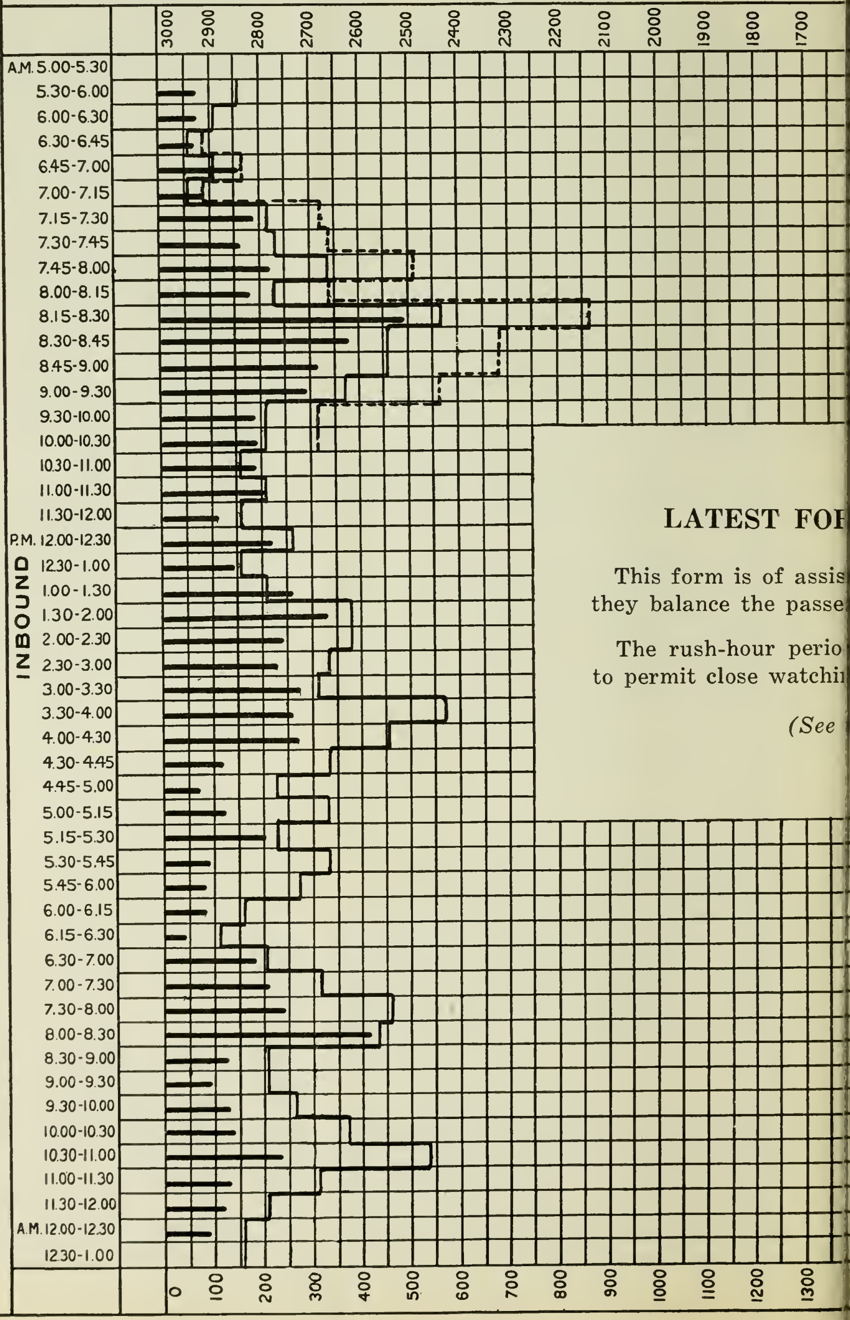
Time	Seats	Passengers	Pass. standing	Seats unused
5:04	52	45	—	7
T	62	30	—	32
5:09	52	50	—	2
T	62	45	—	17
5:14	52	60	8	—
T	62	70	8	—
5:25	52	14		38
T	62	8		54
5:27	52	90	38	—
T	62	80	18	—
5:38	52	95	43	—
T	62	100	38	—
5:42	52	45	—	7
T	62	50	—	12
5:44	52	80	28	—
T	62	65	3	—
5:49	52	18		34
5:53	52	80	28	—
T	62	70	8	—
Total	1078	1095	220	203

FORM 5786

ROUTE No. 2075

– TRAFFIC & SERVICE CHART –

ROUTE ARBORWAY STA. – PARK ST. SUB.
COUNT TAKEN AT HUNT. & MASS. AVES.
ON FRIDAY – FEB. 25, 1927
WEATHER CLOUDY
TYPE OF CAR OPERATED *4 – TR.
SCHEDULE OPERATED



LATEST FO

This form is of assis
they balance the passe

The rush-hour perio
to permit close watchi

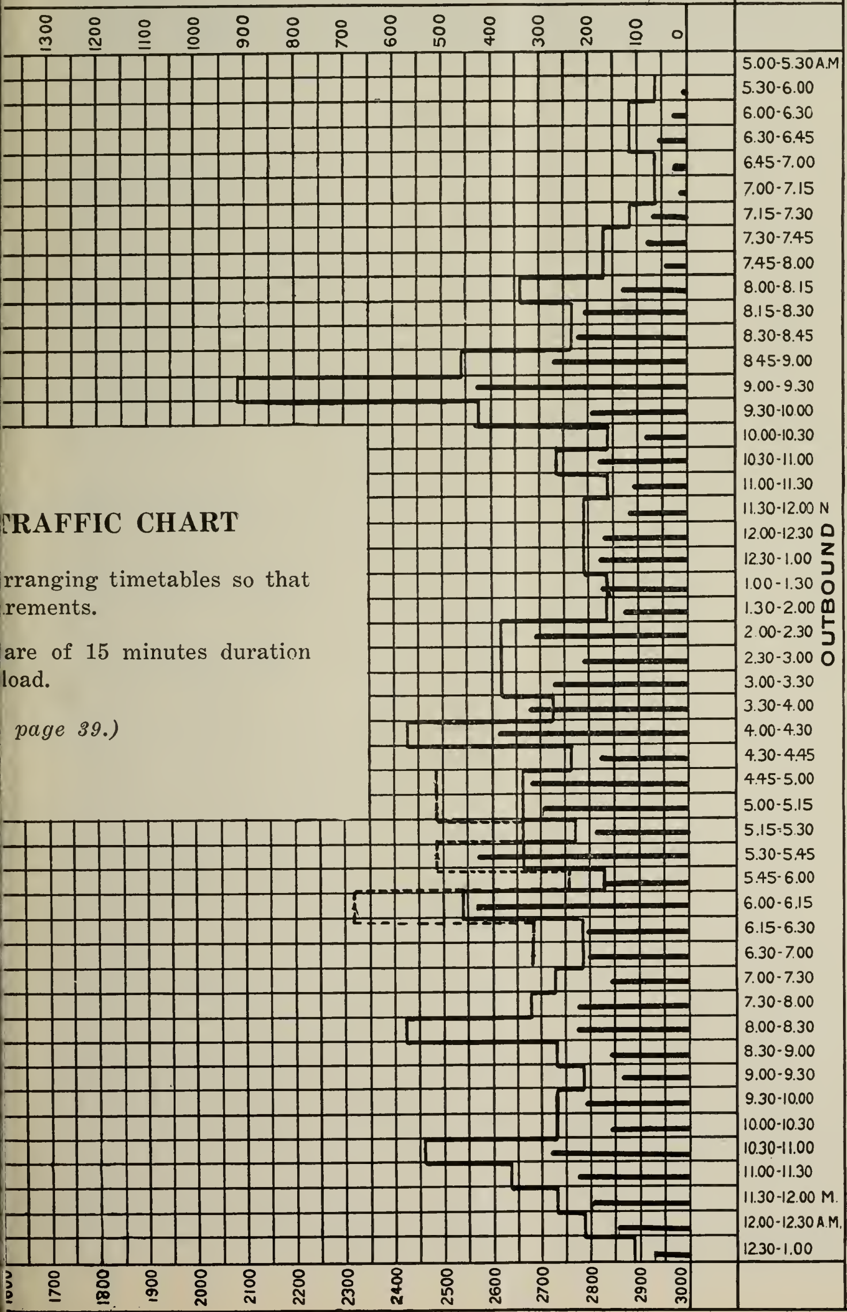
(See

TRAFFIC DEPARTMENT.

Plotted by B.S.W.-H.H.H. Noted by DIV. 2

- LEGEND -

Heavy horizontal lines represent no. of passengers
Light vertical stepped line represent seats offered
Light dotted stepped line represent seats plus 50%



TRAFFIC CHART

rranging timetables so that
rements.

are of 15 minutes duration
load.

page 39.)

CONSERVATION OF MATERIALS AND LABOR*

By RALSTON B. SMYTH

Assistant to Superintendent of Rolling Stock and Shops, Boston Elevated Railway

The department of rolling-stock and shops last year spent about $4,000,000, of which two-thirds was for labor and one-third for material. The subject of conservation, therefore, should include both items.

There are in general two methods of conserving anything. One method is to lock it up and do without the use of it. The other is to use it so as to obtain the utmost return from it.

Stock piled up on stockroom shelves in excess of what is really needed for emergency or current repairs is pure waste. The first step in conservation is to cut down the stock account. This has been done in our department, as indicated by the stock account for the past six years as follows: 1921, $1,182,415; 1922, $841,496; 1923, $822,066; 1924, $786,284; 1925, $653,198; 1926, $658,220.

In using material economically it must first be fitted for the purpose for which it is to be used. The original design of most parts used in this department is made by the car or truck builder or the equipment manufacturer. Sometimes after several years of service, parts are being used which are widely different from the original, partly due to the parts being ordered from samples. Errors are cumulative and in time parts fit only after grinding, pounding and filing. This wastes time and labor.

Then a change in design often takes place, based on experience with the use of the equipment. Where this represents real improvement it should be applied to all similar equipment. Otherwise it leads to departure from standard design and unnecessary expense.

Second only to the necessity for parts being correct is that of applying them correctly. The best armature bearing in the world, for instance, can be ruined by pounding it into a motor head. A first class axle bearing that is not properly tightened in the housing rapidly wears, not only the bearing itself, but the motor shell and cap, and in time causes noisy and rapidly wearing gears.

Correct lubrication is also a factor in conservation. The lack of a few cents worth of oil in an armature bearing, for example, might result in a cost of $50 to $60 for changing and rewinding an armature. The full life of a part should be obtained before it is removed. For instance, the removal of 26-inch wheels with ⅛-inch of wear still remaining increases by 20 per cent the cost per mile of those wheels. We pay for about 300 pounds of metal in each wheel, at about 7 cents per pound, and wear away in service less than 50 pounds. We then sell the scrap at one-tenth the price we pay for new wheels. In addition there is labor and transportation loss involved.

Of course, it is sometimes cheaper to scrap a part during an overhaul, even though it is not entirely worn out, than to continue it in service if it will not last to the next overhaul period. The ideal condition would be that in which all parts had the same life.

Repair of worn parts offers many opportunities for conservation. For example, if a brake lever with hardened steel bushings is removed from service before the bushings are worn through, new ones can be pressed in at very small cost. If left in service too long the bushings wear through, the hole in the lever itself wears badly and the lever is expensive to repair.

Conservation of materials is important but it is in the conservation of time that the greatest hope for improvement lies. What can be done in this line is illustrated by the manufacturing methods of Henry Ford. In large production shops, planning is so complete that for weeks in advance plans are made for a certain part to go to a definite machine at a definite hour on a prescribed day. We cannot carry out planning to such detail as this, as ours is maintenance rather than production work. But because planning is harder, is no reason for abandoning it. Our opportunity is widespread and to a large extent each man must do his own planning. This means that we must analyze our work, classify it, grade it as to importance and plan to do it in the order of its importance in the easiest possible manner.

In our carhouse work, maintenance divides itself into inspection and repair. There is a nice relationship between these two classes of work. Inspection can be carried beyond the useful point and be a waste of time and money. On the other hand, if not enough inspection is done, failures in service occur and repairs are numerous and expensive.

The public utilities of the United States pay out approximately $700,000,000 a year in taxes, which roughly figures $1,350 per minute.

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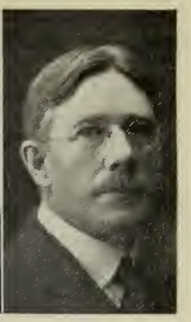
* Abstract of talk before final rolling-stock and shops department group conference, J. M. Patten, chairman, March 2, 1927.

Mr. Studley

Mr. Laffin

Mr. Tripp

Mr. James


Mr. Senter

FORMER DIVISION FOUR SUPERINTENDENTS

Above are the portraits of the five superintendents of Div. 4 who preceded Supt. A. S. Scott. Their terms as superintendent were as follows:

J. H. Studley,	Aug. 1886-Dec. 1898	12 yr. 4 mo
R. T. Lafflin,	Dec. 1889-Dec. 1900	2 yr. 1 mo.
Geo. R. Tripp,	Dec. 1900-Apr. 1907	6 yr. 4 mo.
L. T. James,	Apr. 1907-Jan. 1910	2 yr. 9 mo.
A. W. Senter..	Jan. 1910-Jul. 1924	14 yr. 6 mo.

Mr. Studley was born in Charlestown in 1828. After schooling in Charlestown he became man-of-all-work for his father's coach company. His hours often covered from 6 a. m. until after theatre closing at night. The coaches were replaced with horse cars operated by the Middlesex Railroad, of which he became superintendent in 1861. At first there were but three cars. They were entered by a door at the rear while the driver sat on top and collected his own fares. When the end of the route was reached the body of the car swung around on a swivel. When the West End Street Railway purchased control of the "Consolidated Road," which succeeded the Middlesex, Mr. Studley became superintendent of Div. 6, which then comprised Everett, Malden, Medford, Somerville, and Charlestown. In securing rights of way the West End engaged in many bitter controversies, and Mr. Studley in familiarizing himself with the law in this field became expert and became well known through his success in these controversies. The esteem in which his employees held Mr. Studley was shown by demonstrations on several occasions. He retired at the age of seventy, after fifty-five years of continuous service.

Mr. Lafflin started work for the West End as conductor in Div. 6. He became successively starter, superintendent of employment and successor to Mr. Studley. After two years he became general manager of the Worcester Consolidated Street Railway. Again after a few years he was sent to Manila, P. I., as head of street railway, under what is said to have been a 3-year contract with Stone & Webster.

Mr. Tripp was early a conductor in Div. 7, after which he was stable foreman at Harvard Square. He took great pride in seeing that the horses used by General Bancroft were well-groomed and satisfactory in every particular. He was superintendent of South Boston Division, then Div. 5, and then was transferred to Div. 6 to succeed Mr. Lafflin. In 1907 he was made superintendent of transportation, which position he held nearly up to the time of his death. Mr. Tripp was a shrewd Yankee and on the side was a Maine farmer. He applied his experience with farm horses in his work.

Mr. James was at one time a conductor in Div. 6, then street inspector, next chief inspector. He succeeded Mr. Tripp, and later was transferred to dispatcher at the central power station yards, the position he now holds.

Mr. Senter was appointed conductor in Div. 5, South Boston in 1885, and was rapidly promoted to clerk in the bureau of audit, chief clerk in Div. 2, superintendent of employment (1989-1904), superintendent of Div. 2 (1904-1910), and superintendent of Div. 6 to succeed Mr. James. In 1918 Div. 6 was changed to Div. 4. In 1924 Mr. Senter was transferred to superintendent of Div. 2, which position he now holds.

CONTENTMENT

I have to live with myself, and so
I want to be fit for myself to know.
I want to be able as days go by,
Always to look myself in the eye.
I don't want to stand, with the setting sun,
And hate myself for the things I've done.
I want to go out with my head erect,
I want to deserve all men's respect;
But here in the struggle for fame and pelf,
I want to be able to like myself.
I don't want to look at myself and know
That I'm bluster and bluff and empty show.
I can never hide myself from me,
I see what others may never see;
I know what others may never know,
I can never fool myself, and so,
Whatever happens I want to be,
Self-respecting and conscience free. —*Exchange.*

ELEVATED CLOSE-UPS

The Signal and Interlocking Maintainer

(See Illustration on Front Cover)

At present the signal division of the maintenance department is maintaining 634 power-operated signals and 140 power-operated track switches for the protection of train and car movements over the rapid-transit system and a portion of the surface lines system. They represent an investment of over $1,111,000.

Signals are of either the automatic block or interlocking type, and switches are of either the interlocking type for rapid-transit lines, or trolley-contact-controlled with pneumatic operating mechanism for surface lines.

To maintain this equipment requires a force of forty-five men working in three shifts of eight hours each to cover the twenty-four hours of the day.

These men are known as signal and interlocking maintainers.

Their duty is to maintain the apparatus under their care at as high a degree of perfection as possible, in order to prevent unnecessary failures which would cause interruptions to traffic.

When failures occur, it is important that the trouble be remedied in the shortest possible time consistent with safety, and it is here that a man's knowledge and experience are of the greatest value.

During 1926, the 513 signals and 129 switches included in the rapid-transit system performed a total of 43,441,073 operations. The number of failures during the same year was 674, or one failure to every 64,452 operations.

Of the total number of failures, about 50 per cent were due to causes beyond the control of these men, who are constantly striving to make the signal and switch performance record as near perfect as possible.

MY OWN LITTLE HOME

By Henry V. Neal, Dept. Rolling-Stock & Shops

Way down in a workship the wheels' busy hum
Was making a sound like a low muffled drum.
A workman was whistling a tune he well knew,
And murmured the chorus quite softly all through.
By smithy I went near the fire's ruddy glow
Where men black and grimy struck blow upon blow,
With smiles on their faces while sparks flew around,
The smith on the anvil still rung out a sound.

"A face at the window, a smile at the door,
"A kiss from the loved ones will greet me once more,
"No pleasure can equal, where'er I may roam,
"My heart's dearest treasure, my own little home."

Then down in the market, the same sound I heard,
It trilled and it warbled like notes from a bird,
One thought that was cheering the great city mart,
The one ever welcome, the song of the heart.
The newsboys and shoeblacks were singing as well,
Tho humble their dwellings, the truth they will tell.
With everyone helping and doing their best,
I joined in their chorus and sang with the rest.

LOYALTY

If you work for a man, in heaven's name work for him. If he pays wages that supply you your bread and butter, work for him, speak well of him, stand by him, and stand by the institution he represents. I think if I worked for a man, I would work for him. I would not work for him part of his time, but all of his time. I would give an undivided service or none. If put to a pinch, an ounce of loyalty is worth a pound of cleverness. If you must vilify, condemn and eternally disparage, why, resign your position, and when you are outside, criticize to your heart's content. But I pray you, so long as you are a part of an institution, do not condemn it. Not that you will injure the institution—not that—but when you disparage the concern of which you are a part, you disparage yourself.

Loyalty supplies power, poise, purpose, ballast and works for health and success. Nature helps the loyal man. If you are careless, slipshod, indifferent, nature assumes that you wish to be a nobody and grants your desire; success hinges on loyalty. Be true to your art, your business, your employer, your "house." Loyalty is for the one who is loyal. It is quality woven through the very fabric of one's being, and never a thing apart.

Loyalty makes the thing to which you are loyal yours. Whether any one knows of our disloyalty is really of little moment, either one way or the other. The real point is, how does it affect ourselves? Work is for the worker. Love is for the lover. Art is for the artist. The menial is a man who is disloyal to his work. All useful service is raised to the plane of art when love for the task—loyalty—is fused with effort.—The Pilot.

"Where co-operation dwells efficiency excels" appears inside the wholesale hardware establishment of Decatur and Hopkins in Boston. It is lettered on a large sign, where employees particularly see it as they come and go. The principle covered by this catchy phrase applies in transportation, as well as in selling hardware.

REAL ESTATE AS AN INVESTMENT*

Pitfalls for Investors in This Field Are Pointed Out, and the Relative Importance of the Land and the Improvements Is Discussed. Repairs on Improvements Must Be Carefully Considered. Real Estate Owners Profit by the Constant Decrease in Purchasing Value of the Dollar.

IN the spring of 1926 in the course in investing savings, William Minot, of the Boston Real Estate Exchange, spoke on real estate as an investment. A brief abstract of Mr. Minot's talk follows:

To make the advantages of real estate as an investment clear, it is well to begin with some of the pitfalls and dangers which one must look out for in this field. This discussion will relate to investments in property without reference to the mortgage or the equity. Nor will real estate bonds be considered, because they are different from investments in real estate.

To begin with, vacant lands are in general not investments because they do not bring in an income. One must double his money on such land about every ten years to break even. There are, of course, exceptions where land can be used to produce revenue, but as a rule improvements or equipment must be added to yield earning power.

Land is the real estate and the buildings or anything else put on the land are equipment. The Boston Elevated Railway's tracks are like land and the cars are equipment.

Real estate equipment wears out and becomes obsolete. For example, a fine office building may be as strong today as ever, but may be out of date, due to small windows, slow elevators, etc. A dwelling house may produce less revenue just because it is out of style. The more showy, unusual and ornate a building the greater the danger of obsolescence. The safest investment is the one nearest to standard.

Too much reliance must not be put on appreciation of land. If an expensive house is built on cheap land, the land must increase enormously in value to make up for the depreciation of the house. With a cheap building on expensive land, well located, say a store in the retail shopping district of Boston, the case is different. As a rule, it is best to get as much investment in the land and as little in the building as possible.

Do not be fooled into believing that repairs are not an inportant item even in a new building. There are repairs the first week in such a building. Allowance must be made for them in estimating the income from a building. This is the case also with the cost of looking after the building, whether it is done by the owner or his agent.

Another item is the suitability of an improvement for its neighborhood. The Park Square Building, if located near Dudley street terminal, could not be rented. This feature is more important than the cost of the building, which does not determine what it will bring in revenue. Allowance must also be made for vacancies over a period of years.

All of these factors suggest the advantages of real estate trusts or corporations rather than individual ownership of property. If shares of such corporations are purchased, however, it should be from a reliable concern. One trouble with the advertisements of real estate corporations is that they are apt to contain estimates of worth rather than costs.

As to mortgaged property there is no great objection to a mortgage provided it is not too large and the property is well located.

The foregoing is not intended to discourage investment in real estate, but merely to point out the pitfalls. From the experience of our office we believe that real estate is the most satisfactory form of investment. It is something that you can see. Then real estate is the only kind of investment which is not subject to constant depreciation on account of the shrinking purchasing value of the dollar. The revenue increases as the value of the dollar goes down. Again, the growth of the country practically insures steady increase in the value of well-located real estate. The pressure of increased population causes this.

To summarize, I feel that if a real estate investment is in an income-bearing property, land properly equipped with adequate buildings and suitable for the environment, and an adequate sinking fund is allowed for depreciation and obsolescence it is practically the only form which is not subject to shrinkage from the depreciation of gold.

MR. MINOT'S ANSWERS TO QUESTIONS

Following the talk, Mr. Minot answered a number of questions, in part, as follows:

Q. Do you think that following the rapid rise in real estate over the last two or three years, we are now seeing evidence of a flattening out?

A. Yes, I do. This is a time for great caution. Every line of real estate has been pushed near the top.

Q. Would it be advisable for a man on a small salary to buy cheap real estate where the rents are fairly low?

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* Seventh in series of talks in the course in investing savings, L. J. Dickey, chairman.

A. It might be better to wait a year or two to see what happens. I think the business is overdone at the moment.

Q. Isn't there a wave of building all over the country?

A. Yes, and vacancies are increasing.

Q. What is going to be the effect of the increasing wages being paid in the building trades?

A. These wages are due to restricted immigration. The situation will change if the building boom stops. As long as wages go up, it is advantageous for the person who has real estate, because he makes his competitor come in on a higher basis.

Q. What do you consider a fair return on an investment in a home, one occupied by the owner?

A. Six per cent is a fair return, provided that, say, 2 per cent a year is allowed in addition for depreciation and repairs.

Q. Is it advisable to buy a house already built or to build one's own home?

A. There are advantages in buying one already built, even at a higher price. You know definitely what you are going to pay, which you do not when you build a house.

Q. What is a good safe equity to have in real estate?

A. Generally about 50 per cent.

Q. Is it advisable to buy a home with a second mortgage?

A. It is the total amount of the mortgage that counts. There is a prejudice against second mortgages; no institutions will take them. Individuals might take them if the total is not too large.

Q. Is a title-guaranty insurance policy desirable?

A. Titles are not insured to any extent in Boston, but in New York and Chicago, this is general. We rely on our lawyers.

EVIDENCE OF REAL INTEREST

The editor of Aera, the monthly publication of the American Electric Railway Association, recently wrote the general manager calling attention to a subscription that had just been received from an "El" motorman. This employee and others who are subscribers to electric railway publications are to be commended. Through reading such publications they broaden their knowledge of the electric railway business, as well as learn of details which help them in their everyday work.

PENSION LIST

Eleven names were added to the pension roll in February, as follows:

Patrick O'Connor, trackman, general yard.

M. J. Doyle, special officer.

A. Dwinell, gateman.

J. E. Keefe, operator.

J. F. Moran, warder.

M. Mulkern, paver.

Miss E. C. Priest, clerk, general office.

C. R. Proudfoot, foreman, maintenance department.

A. L. Russell, gateman.

H. H. Spear, motorman.

J. P. McCue, operator.

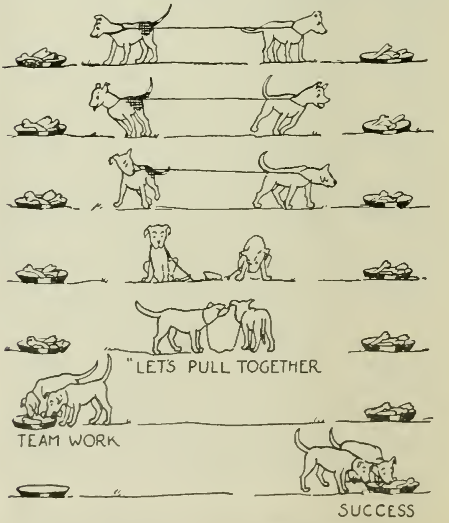
W. S. Collins, formerly yardmaster, and Henry D. Miller, cash counter receiving department, died during the month.

There are now 370 names on the pension roll.

Vacation is a lazy thing, there's naught to do but row the boat and climb the tree to fix the swing and scale the mountain like a goat and catch the fish and cook the same and forage fuel to feed the flame, and work all morn to mend the tire and toil and tug like any team to haul the flivver from the mire and trudge six miles for gasoline and brace the tent against the gale and fight with skeeters tooth and nail and swim a league into the bay and strenuous rounds of golf to play and help put in ten tons of hay and dance until the break of day—

Tom Edison is right, by jing!
Vacation IS a lazy thing.

—*Exchange.*



How Co-operation Gets Results

What Do You Know About the "El"?

FOLLOWING the fashion of the day, the questions below are offered as a means of testing our knowledge of the railway. The answers can be found, if needed, in recent issues of "Co-operation."

1. How much money has the railway invested in snow-fighting equipment?
2. What will be the approximate cost of the Dorchester rapid-transit extension now approaching completion?
3. How much money is invested in the Boston Elevated Railway?
4. About how is the investment divided among the following: The State of Massachusetts? The City of Boston? The Boston Elevated Railway Company?
5. What were the four elements of success outlined in an early issue of "Co-operation" last year?
6. What was the cost of accidents to the railway for 1926?
7. About what percentage of the vehicles now operated by the Elevated are buses?
8. What type of vehicle is used by the Elevated in the largest numbers?
9. What was the estimated cost of the boiler-house extension at South Boston?
10. What are some characteristics of public utilities?
11. What was the cost to the railway for snow removal on the property during December, 1926?
12. What is the reserve fund and how does it stand as compared with last year on March 1?
13. Has the railway more passengers or fewer for the first three months of 1927 as compared with the same period in 1926?
14. How does the monthly bus mileage compare with what it was a year ago?
15. What is the de luxe bus service which is proposed to be operated from a residence suburb to a business district in Boston?
16. When was the first bus operated by the Boston Elevated Railway?
17. Did the complaints against employees show increase or decrease for January, February and March as compared with the same period of last year?
18. What is the approximate total revenue of the railway for a year?
19. How many persons are on the pension roll at present?
20. What is the annual cost of pensions?
21. Name the trustees who supervise the operation of the railway.
22. Who is chairman of the trustees?
23. What is the "Northern Artery"?
24. What is the most important single cause of trolley breaks?
25. How many buses can be accommodated at the new garage in Somerville?

CHANGES IN THE RESERVE FUND

Fiscal Year 1925-26

July 1, 1925, $1,000,000

July	$249,477.93*	Jan.	$223,30190†
Aug.	367,593.94*	Feb.	185,989.63*
Sept.	176,763.97*	Mar.	161,772.65†
Oct.	117,703.96†	April	77,031.69†
Nov.	45,265.00†	May	57,010.06†
Dec.	289,347.71†	June	1,662.18*

Profit and loss credit....$32,359.07

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	$393,028.41*	Jan.	$186,947.50†
Aug.	451,546.79*	Feb.	92,018.37†
Sept.	236,543.80*		
Oct.	2,723.19†		
Nov.	29,302.22†		
Dec.	234,879.91†		

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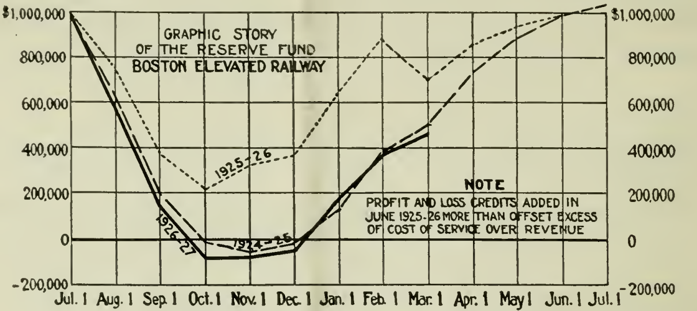
†Excess of revenue over cost of service.

*Excess of cost of service over revenue



FEBRUARY OPERATION

GENERAL FINANCIAL DATA	1927	1926
Revenue exceeded cost of service	$92,018.37	
Cost of service exceeded revenue		$185,989.66
Operating revenue per car-hour (A.E.R.A. std.)	$6.40	$6.60
Operating revenue per car-mile operated	65.04c	68.98c
Average fare per revenue passenger	9.226c	9.256c
Ratio operating expense to operating revenue	69.15%	78.17%
PASSENGERS CARRIED		
Revenue passengers	30,853,649	30,963,854
Per cent 5c and 6c passengers	18.82%	18.12%
Revenue passengers per car-mile operated	6.826	7.303
OPERATING FACTS		
Trips operated	580,311	546.890
Car-miles operated:		
Rapid-transit lines	1,200,348	1,141,322
Surface, two-man	1,704,746	1,791,136
Surface, one-man	1,183,014	1,023,823
Express, newspaper and sprinkler cars	———	5,633
Motor bus	431,683	277,635
Total miles operated	4,519,791	4,239,549
ACCIDENT DATA		
Accidents per 10,000 car-miles	2.28*	3.38*
Accidents per 10,000 bus-miles	4.47*	7.74*
Revenue passengers carried per reported accident	27,418	21,560
Average number of witnesses per accident	3.28	3.23
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	26	28
Employees complained of by car riders	109	111
Car defects reported per 10,000 car-miles	4.3	6.7
INFORMATION ABOUT POWER		
D.c. kw.-hr. output gross per month	25,159,185	26,341,420
Maximum kw. load	84,170	82,940
Tons of coal consumed for power	21,542	21,712
Lbs. of coal for power per d.c. kw.-hr. at cars	1.882	1.851
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	0.881c	0.831c
Per revenue car-mile	5.04c	5.17c
Kw.-hr. per revenue car-mile	5.723	6.223

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*This does not include miscellaneous accidents or derailments.

March 25, 1927.

EDWARD DANA, *General Manager,*

Boston Elevated Railway
CO-OPERATION

Volume 6 APRIL, 1927 Number 4

Boston Elevated Close-Ups

THE OPERATOR
(See Page 57)

To All 'El' Employees

Webster says:

> *"Teamwork is work done by a number of associates, usually each doing a clearly defined portion, but all subordinating personal prominence to the efficiency of the whole; as the teamwork of a football eleven or a gun crew."*

Of the four elements of success,

Courtesy —
Safety —
Waste Elimination —
Teamwork —

teamwork is the most important because it makes all the others possible.

A study of the diagram which appears on the last page of each issue of "Co-operation" indicates that the reserve fund is following very closely the curve for 1924-1925. It reached its low limit in September. In order to restore the fund to its full amount, $1,000,000, by July 1, teamwork will be necessary.

On this page last month this slogan was suggested:

A PER CENT SAVED A DAY
KEEPS THE DEFICIT AWAY

This means teamwork.

Or, as Kipling puts it:

"It ain't the guns nor armament, nor funds that they can pay,
But the close co-operation that makes them win the day,
It ain't the individual nor the army as a whole,
But the everlastin' team work of every bloomin' soul."

Edward Dana

COLLECTING FARES ELECTRICALLY

Automatic Passimeters Which Simplify Fare Collection Have Been Installed at a Number of Important Stations on the "El" System

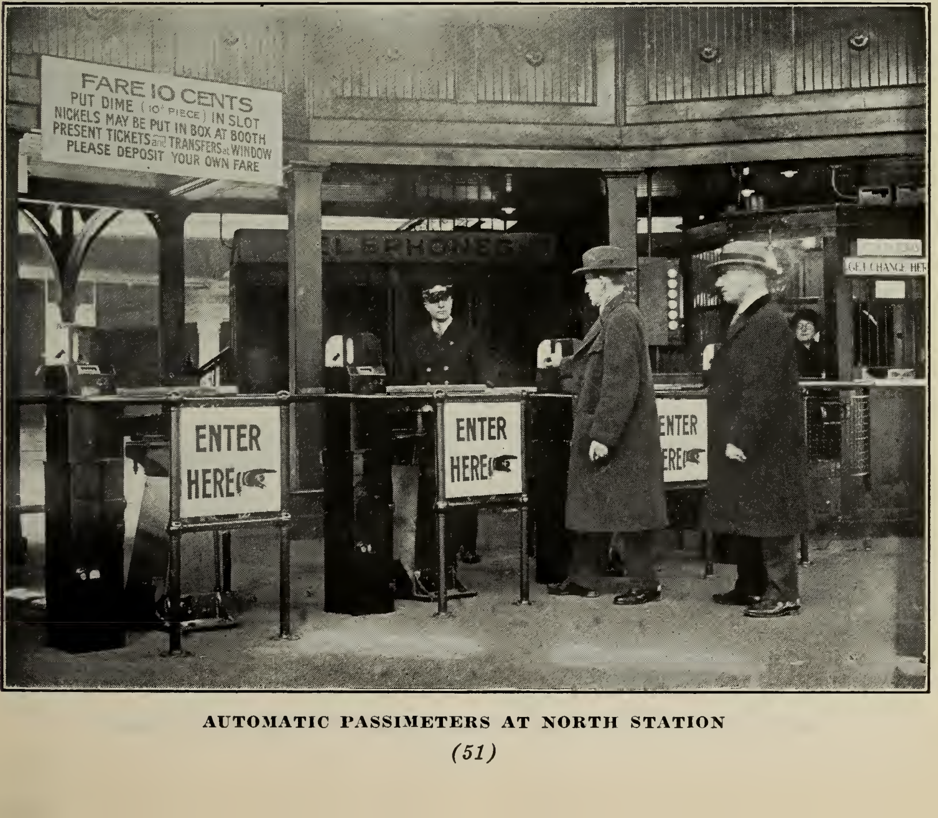
AFTER a year's trial of automatic passimeters which were installed, three each, at Boylston and Winter tunnel stations, fifty more of these, of the General Electric type, have recently been installed at rapid-transit stations to replace motor-driven fare boxes. The locations are as follows:

North Station	9
Park Street, upper and under	14
Summer Station	6
Harvard Station	8
Dudley Street	4
Sullivan Square	8
Copley Station	1

These passimeters are of the two-way type, that is, they automatically unlock to admit a passenger when a coin is inserted in the slot (in this case a dime), and they will revolve freely in the reverse direction to permit exit. The unlocking of the turnstile is accomplished by means of an electrical connection made when the dime is dropped into the slot, which is so arranged that no other current coin can be deposited. When the electrical connection is made between two contact points, the stile is permitted to make a quarter turn. It is then locked until another coin is deposited.

Each passimeter is capable of admitting about fifty persons per minute when the patrons are accustomed to their use. The fare box is well ahead of the turnstile so that the turnstile is unlocked before the passenger reaches it. As the arm is locked until the fare is deposited, the passimeter furnishes an automatic "pay-before-you-enter" system of fare collection.

Being two-way turnstiles, these devices serve to guard exit as well


FARE 10 CENTS
PUT DIME (10¢ PIECE) IN SLOT
NICKELS MAY BE PUT IN BOX AT BOOTH
PRESENT TICKETS and TRANSFERS at WINDOW
PLEASE DEPOSIT YOUR OWN FARE
ENTER HERE
ENTER HERE
ENTER HERE
GET CHANGE HERE

AUTOMATIC PASSIMETERS AT NORTH STATION

as entrance. As the new devices are introduced, the older high-exit turnstiles are being done away with where possible.

Of course, the passimeter accommodates only one line of passengers and two are required to replace one motor-driven fare box. As the machines take dimes only, passengers needing change get it at a change booth as formerly, while those paying fare with two nickels, transfers or tickets pay their fare at the booth and are admitted through the mechanical passimeter at the change-window, where young women are in attendance as formerly.

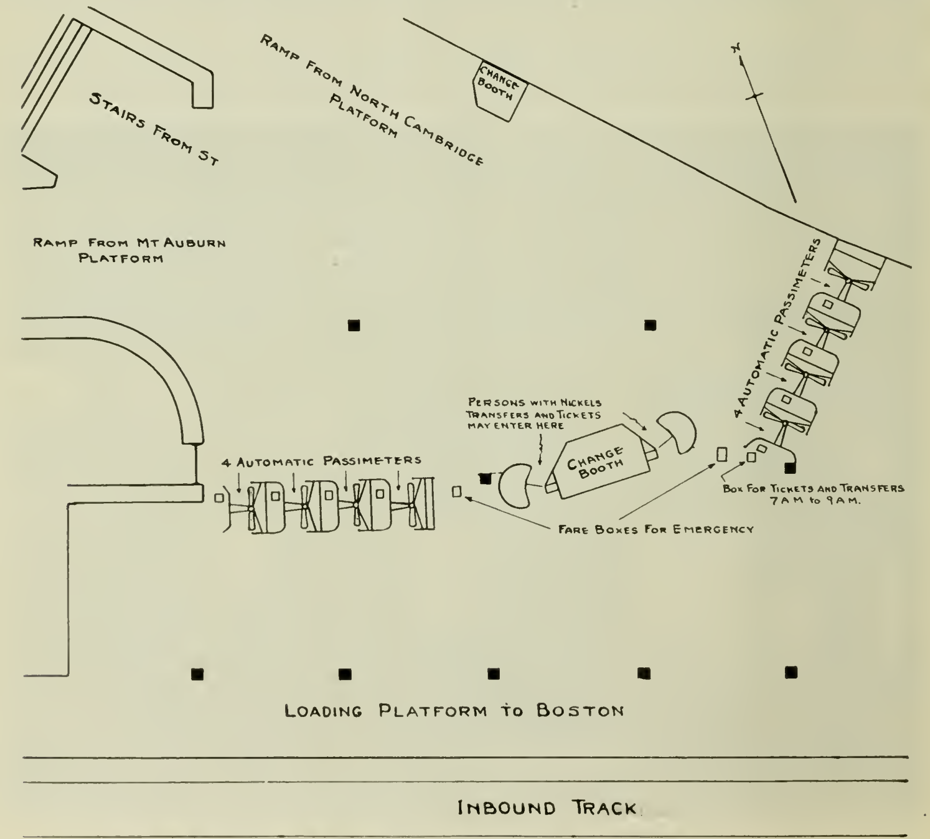
These new machines are of the same general type as several hundred which have been in use in the New York subways for a long time. They differ in that they are operated by dimes, the smallest current coin in general use, hence require more delicate adjustment than machines designed for coins of larger size.

The principal reason for the installation of these passimeters is to safeguard the revenue. In the rush and confusion of periods of congestion it has been possible for unscrupulous passengers to cause loss to the Railway.

MUSICAL CLUB DANCE COMING

On Monday evening, May 9, the Boston Elevated Musical Club will give its annual dance at the Chateau Dansant, 353 Huntington avenue. Music will be furnished by Eddie Fitzgerald's orchestra. While under the auspices of the Musical Club the dance is for all employees who may wish to attend.

The wife of a careless man is almost a widow.—*Commonwealther.*


Stairs From St
Ramp From North Cambridge Platform
Change Booth
Ramp From Mt Auburn Platform
4 Automatic Passimeters
Persons with Nickels Transfers and Tickets may enter here
Change Booth
4 Automatic Passimeters
Box For Tickets and Transfers 7 A M to 9 A M.
Fare Boxes For Emergency
Loading Platform to Boston
Inbound Track

AUTOMATIC PASSIMETER INSTALLATION AT HARVARD STATION

INVESTMENT VERSUS SPECULATION *

These Terms Are Defined and Illustrated. The Principles Underlying Reasonably Safe Investments Are Explained and There Is Some Discussion of Actual Cases to Show the Application of the Principles

C. B. GLEASON of the general counsel department of the Boston Elevated Railway was the speaker on this subject in the course in investing savings, Mr. Gleason having been requested to discuss this topic on account of the study which he had made of it in his capacity of trustee for estates.

He began by defining the two terms as follows:

Investment is a change of money into property to produce an income, the accent being on income.

Speculation, on the other hand, is the assumption of a risk to get a profit, the accent here being on profit.

It is impossible to define the terms with absolute distinction, because there is some risk connected with all investment, and securities bought for speculation usually produce income.

The courts and the legislature of Massachusetts adhere to the principle that investment has for its motive the securing of a reasonable income with a great degree of security in the principal and speculation considers income casually but expects profit. The law requires, first, that trustees should invest money as intelligent men familiar with securities invest their own money for permanent investment; and second, that they should keep the risk reasonably divided among different securities.

For persons unfamiliar with securities and values, perhaps the only safe form of investment is in co-operative banks, savings banks and life insurance. For those who demand larger returns there are certain investment principles which should guide them. These may be summarized briefly as follows:

Among common stocks, new and untested securities should be avoided as speculative. On the other hand, a well-managed, established concern that has charged off liberally to depreciation and obsolescence and has accumulated a surplus, with earnings which have shown a fairly steady rise, products well diversified and in a moderately competitive field, offers opportunity for investment. Securities which are listed on the stock

CLOSE-UP OF ONE OF THE PASSIMETERS AT NORTH STATION

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*Eighth in a series of talks in the course in investing savings, L. J. Dickey, chairman.

exchanges necessarily supply data by which their standing can be analyzed.

The problem of purchasing stocks cheap is a difficult one. Not much help is given by the professional agencies which attempt to predict great market movements. But practical common sense will indicate when prices are low and the time is ripe for investment. Unless investments are governed by a careful analysis of the past performance of the company, one is apt to get into the speculative field.

As to speculation, the experience of brokerage houses has been that margin speculators almost always "go broke." Gambling on stocks on margin is just like playing poker or gambling on horses, the chance of winning in the long run is practically negligible.

Within the past few years very interesting studies have been made of the price course of high-grade listed stocks. If we add to the actual price the value of rights and stock split-ups and form a price line of the average, of say the ten most active stocks on the New York market, or on some other basis that provides a reasonably good selection, we find that the average prices will increase about in the same percentage as the increase of population of the country.

After a period of ten or fifteen years this increase of 2½ per cent per annum becomes very considerable. It is believed, however, that those stock which show these increases are always well seasoned stocks that have made liberal charges for depreciation and obsolescence, have accumulated considerable surpluses, have had substantial assets to support the selling price and have been in fields where a reasonable income was possible.

I do not think that experience justifies the ordinary man in going into new ventures and new enterprises. The evidence shows that the chance of profit is not justified in view of the risk of loss.

By way of illustrating his remarks, Mr. Gleason assumed that a trust fund was going to be divided between stocks and bonds, to give a proper division of the risk, and that the trustees had come to the point of selecting a stock to be bought. He considered a number of leading stocks in different fields and cited the facts regarding each which bear upon its value as an investment. He picked stocks for discussion that are likely to show a profit as well as a good income return.

Mr. Gleason's Answers to Questions

Following the address Mr. Gleason answered a number of questions. An abstract of the question-and-answer discussion follows:

Q. How is it that gambling on Wall Street is legal and playing poker is illegal?

A. Court decisions are to the effect that if a person actually buys or sells a stock in an actual transaction it is trade and not gambling. It is a fine distinction, but the line has to be drawn somewhere.

Q. Is the best time to buy a stock when an industry is in depression?

A. Always. This suggests the famous remark of Russell Sage, that he made most of his money buying things when they were cheap and selling them too soon.

Q. The speaker has referred to common stocks altogether. How about preferred shares?

A. The purchaser of preferred shares takes most of the risks of the business and does not get the profit. The dividends on preferred stocks are limited. Unless preferred stocks can be converted into common stock it is well to let them alone. Of course, there are exceptions to this rule.

Q. Do you consider tangible assets essential in making an investment?

A. Hardly as strong as that. The fact of unusual earning power has to be taken into account, such as might be connected with the ownership of an important patent. At the same time one should be always suspicious of anything without tangible assets.

Q. Is not that true with regard to such stocks as Kresge, Woolworth and Sears-Roebuck?

A. I believe so as to Kresge and Woolworth. The sales of these companies fall off during a period of industrial depression.

Q. What is the relation between price and earning power as to the proper time to buy or sell?

A. I believe that the general state of the market is more important than a particular earning power.

Q. Would you prefer a bond or common stock in investing in a railroad?

A. That depends on the general state of the market. If the railroad is not overloaded with debt and the general market is low I should prefer the stock; if the market has been rising for a long time and business is very good I should prefer the bonds. I should hold a bond until we get to a period of depression and then switch over.

The United States owns 35 per cent of the railroad mileage of the world and yet has only 6 per cent of the total population.

BOSTON ELEVATED RAILWAY BOWLING LEAGUE

Final Standing

	Won	Lost	Pinfall
R. S. & S.	82	22	37174
Division Two	79	25	37113
Rapid Transit	77	27	37341
Repairmen	72	32	36117
Steel constr.	71	33	36409
Division Three	52	52	34993
Sullivan Square	51	53	35400
General manager	48	56	34122
Division Four	44	60	34979
Receiving	41	63	34286
Division One	39	65	34864
Claim	33	71	34701
Supervisors	25	79	33664
S. B. Power	15	89	34831

Men With Averages of 90 or Over

Ritchie, 101; Doherty, 100; J. McCrystal, 99; Olin, 99; Wilson, 97; Hadley, 97; Reardon, 96; Potterton, 96; Bunney, 96; Rose, 96; Lamb, 96; Foley, 96; McCarthy, 95; Law, 95; Hasson, 95; Coffey, 95; Nelson, 94; Adams, 94; Moccia, 94; Tower, 94; J. F. Power, 94; O'Brien, 93; Wright, 93; Downey, 93; Toohill, 93; Quinn, 93; Lyons, 93; Callahan, 93; McGovern, 92; Page, 92; W. McCrystal, 92; Grant, 92; Murphy, 92; Maw, 91; McLeod, 91; Morgan, 91; Donohue, 91; Forrest, 91; Sullivan, 91; Drown, 91; McSweeney, 90; Graham, 90; Dawson, 90; Doyle, 90.

In the United States in 1925 a grand total of 22,322,000,000 kilowatt hours of electric energy was produced from water power sources and 65,801,000,000 was produced from all sources.

Of the total world production of rubber last year about 70 per cent was imported by the United States to meet the increased demand of the automobile tire industry.

A HUNDRED NEW ELEVATED CARS

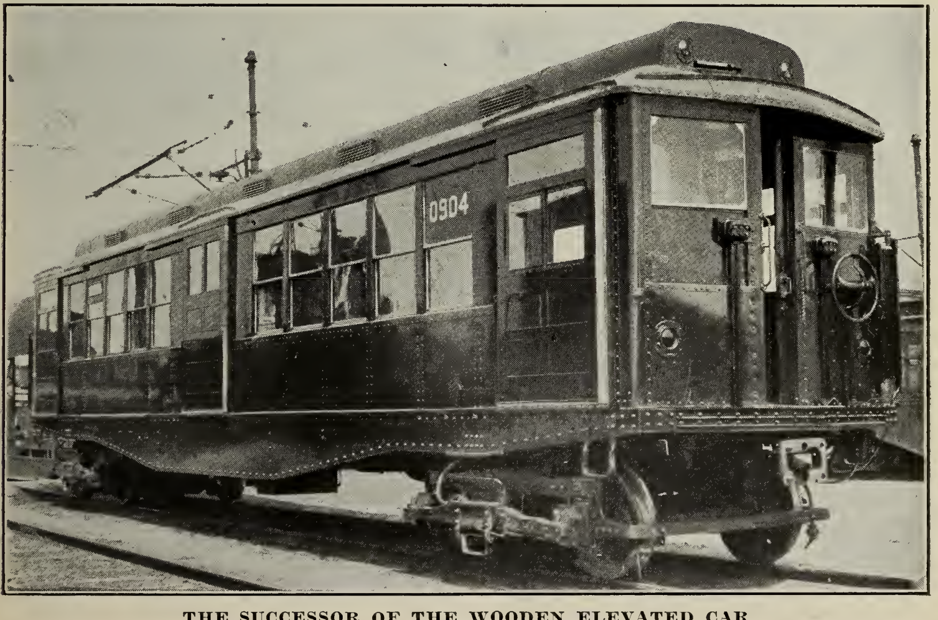
There are now under construction for the Railway by the Laconia Car Company and the Wason Mfg. Company a hundred new steel car bodies to replace wood car bodies on the Rapid Transit Lines. The seventy-five Laconia cars will be known as No. 9 Elevated cars and the twenty-five Wason cars as No. 10 Elevated cars. The cars are already being received and a delivery rate of two cars per week is expected.

Each car is mounted on a motor truck and a trailer truck. The motor trucks are being taken from older types of Elevated cars which are to be destroyed, and the trailer trucks are being purchased from the Taylor Electric Truck Company.

The No. 9 cars will have Westinghouse A.L.M. multiple-unit control and the No. 10 cars, General Electric P.C.10 control.

The new cars are of the same length as the standard Elevated cars, and the side doors are arranged to slide on the exterior of

(Concluded on page 62)



THE SUCCESSOR OF THE WOODEN ELEVATED CAR

WHY IS ACCIDENT EXPENSE SHEER WASTE?

In the examination held to determine the car and train service men to be sent as delegates to the National Safety Congress at Detroit, the following question was asked:

"We are frequently told that the money we pay out for accidents is waste. Why is this so?"

Some of the answers are given below:

"Because it could be used to improve the service."

"Because that money could be used for new equipment or to improve the service in general."

"Because it is a part of the cost of service for which there is nothing produced nor any return therefrom."

"Because such money spent is gone without any income from it at all. All other money spent has some income, but none at all from money spent on accidents."

"For the Railway it represents nothing produced. The public loses service, as this money would buy more cars and equipment."

"Because the Railway does not benefit by it in any way whatever. It is a dead loss to the Railway. Also because they cannot use it to provide better service or buy new equipment."

"Because it provides nothing for the Railway. Coal bought provides power to run the cars; wages paid provide the men with power; but money paid for accidents provides nothing, and benefits neither Railway nor car rider.

"No one is benefited but the person who receives the money, although it does not restore lost limbs or life. The money could be used to improve the service by providing new cars, tracks and transportation in general."

"No one benefited—not a single life is restored, nor a maimed person made whole. Untold suffering is brought upon the victims and his dependents. No one is benefited and the traveling public, under our present system of management, must pay the cost in money."

"Because many claims that are paid could be avoided and saved had the conductor or motorman used just a little more care and been on the alert at all times."

"The money paid out in accidents could be used for other purposes, such as to buy equipment, and would help relieve the taxpayers and everyone would be better satisfied, and so it practically goes to waste."

"The Railway gets no return absolutely from money that is paid out in claims. Might as well take such money and burn it up; would get just as much return out of it; and it makes an increase in the burden of the road towards putting the road on sound basis, and it increases burden of passengers by keeping the 10-cent fare."

"Those who receive this money perform no service for same. The money could be used by road in increased improvements to cars, barns, lobbies, etc. One item of car repairs alone was last year $178,000. As a reminder to the men what this money could do for them just consider the offer of furnishing free uniforms and caps. If we increase our vigilance who knows but what in future we will receive increased benefits."

ACCIDENTS TO ELDERLY PEOPLE

In memory of the 163 elderly men and women who were killed by motor vehicles in Massachusetts during 1926 while crossing streets, the Metropolitan Life Insurance Company has sent out an appeal to motorists. At the request of the Massachusetts Safety Council, the company asks that people over 55 years old be urged not to leave a sidewalk when automobiles or trucks are approaching. They should cross only when the way is clear, and then only on a cross-walk. On leaving a street car, they should walk directly to the nearest sidewalk and not around the car.

THE MAKIN' OF FRIENDS

By W. B. Sprague, Boston & Maine Carpenter, Worcester

If nobody smiled and nobody cheered and nobody helped us along,
If each every minute looked after himself and the good things all went to the strong,
If nobody cared just a little for you, and nobody thought about me,
And we stood all alone in the battle of life,
What a dreary old world it would be!

Life is sweet just because of the friends we have made, and the things which in common we share;
We want to live on not because of ourselves but because of the people who care;
It's the giving and doing for somebody else—on that all life's splendor depends,
And the joy of the world, when you've summed it all up,
Is found in the makin' of friends.

—*Street Railway Bulletin.*

ELEVATED CLOSE-UPS

The Operator

(See Illustration on Front Cover)

The operator differs from the subjects of the previous "close-ups" in that he does not handle plant or equipment with a view to maintaining it in good order, but he handles equipment in giving direct service to the patrons of the railway. The extent of his work can be visualized by remembering that in 1926, over three hundred and seventy million revenue passengers were carried by the railway.

These passengers were carried on:

1627	surface cars
468	rapid-transit cars
230	buses
a total of 2325	vehicles.

To man these cars there were employed:

2345	operators
526	surface motormen
576	conductors
538	rapid-transit,
a total of 3985	men.

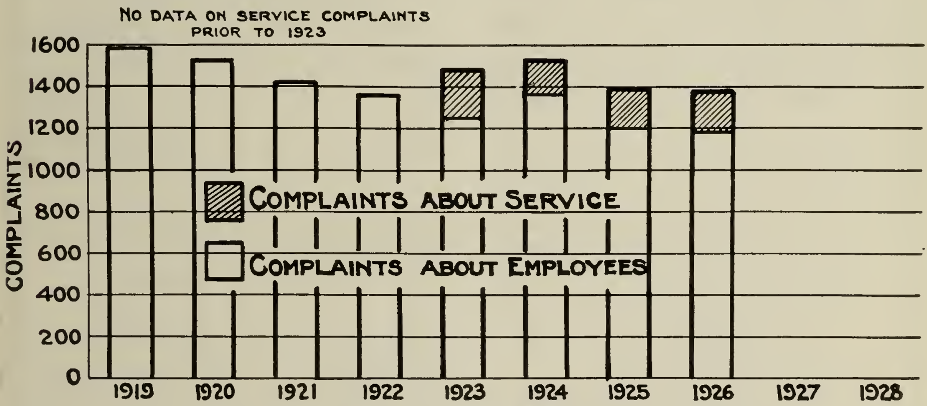
The duties of the operators may be divided into four general classes:

1. Compliance with the law. They are required to be familiar with, and observe all laws and ordinances governing the operation of vehicles in the streets and also other laws affecting street railway work so far as the operation of the car is concerned.

2. Safety. They must operate car, train or bus in such a manner as to insure safety so far as possible to passengers, employees, and the general public, to avoid accidents and to protect passengers from injury.

3. Maintaining schedule time. They are responsible for operating car, train or bus on schedule time as near as possible, thus rendering the regular service which is essential for adequate transportation.

4. Being accommodating. They should operate car, train or bus so as to avoid friction or complaints from passengers, drivers of other vehicles and persons using the public highways. All employees are instructed to be attentive and helpful to passengers at all times without being officious or offensive.



GRAPHICAL STORY OF THE COMPLAINT SITUATION

LET'S NOT HAVE COMPLAINTS

On the last page of "Co-operation" each month appears a statement of the complaints received about service and about employees. These furnish a barometer of the quality of the service from the standpoint of the user. Of course, there are other cases in which the patrons feel aggrieved but do not take the trouble to complain. However, for comparison, the monthly reports are valuable.

In order to show how the complaints are running from year to year they have been put for the first time into the form of a diagram as above. This indicates that there has been a gradual decline in complaints against employees in the 8-year period covered. Complaints of service run fairly uniform but are much smaller in number than the others, roughly one-sixth as numerous.

PLANT IMPROVEMENTS

There was expended by the trustees of the Boston Elevated Railway, between July 1, 1918, and Dec. 31, 1926, a total of nearly $33,600,000 upon road and equipment, either for entirely new property or for replacement of worn-out property. This amount has been expended to provide facilities necessary for the efficient and economic operation of this railway, as follows:

Cars and motor buses	$15,463,000
Car houses, shops and garages	6,171,000
Power houses and transmission of electricity	4,117,000
Surface lines (track and line betterment)	4,906,000
Elevated structures and appurtenances	2,013,000
Miscellaneous improvements	900,000
Total	$33,570,000

When added to the total of $3,434,000, which had been expended upon road and equipment in excess of any capital issues at the time the trustees took charge of the railway property on July 1, 1918, it made a total to be provided for during the first eight and one-half years of public control of approximately $37,000,000.

The money to provide for such betterments came from the following sources:

Part of the proceeds from the sale of preferred stock which the stockholders were compelled to subscribe before the Public Control Act could take effect	$ 2,000,000
Proceeds from the sale of the Cambridge Subway to the Commonwealth	7,868,000
Available from the depreciation charge July 1, 1918, to Dec. 31, 1926	18,856,000
Approximate amount received in settlement of fire insurance losses	1,000,000
Approximate cash proceeds resulting from the sale of real estate properties	1,850,000
Additional bonds issued against the preferred stock which was sold under provisions of the Public Control Act	3,000,000
Premiums on bonds sold	51,000
Capital provided to Dec. 31, 1926	$34,625,000
Additional Boston Elevated bonds issued February 1, 1927	1,926,000
Total	$36,551,000

MORE BIG BROTHER CLUB SAFETY COMPOSITIONS

(See February Issue of "Co-operation" for Explanation)

THE ELECTRIC DANGER

By Robert Peterson, West Acton

Little blue-eyed girl
When you go to store
Watch out for the electric car
That does not wish to hit you,
But if it cannot stop, goodbye to you.

SAFETY FIRST

By Henry T. Chane, Boston

Little girls, little boys, stop and look.
Every day when at your play, stop and look.
If you don't stop, look and listen
In your family there will be one missin'.
If you hop on cars to ride,
You can't tell how fast they go.
Other cars are at your side,
And may hurt you, hurt you so.

SAFETY IN THE STREETS

By Phyllis Guilford, Newtonville

"ABC" is the warning bell!
Such a noisy, noisy clatter,
Up and down the streets they clatter.
Bing, bing, bang, bang,
Go the trucks and teams.
We must be careful of ourselves,
Grownups, too, we don't leave out.
Danger lurks where lives are careless.
Let's watch our feet and steps.

SAFETY PLEDGE AND SAFETY RULES

By Raymond Travis, East Lynn

I will work for the safety of others as I would want them to work for my safety.
I will not take unnecessary chances of getting hurt, and warn others against doing so.
I will try to reduce the number of accidents this year.
All this I will do for humanity and honor of Big Brother Club.

Do not run across the street.
Do not read a paper while crossing the street.
Do not throw a banana peel on the sidewalk.

SAFETY FIRST

By Mary Powers, Concord

When you start out in the morning for school, doesn't your mother tell you to look out for the cars and not to take a ride from some strange man you don't know?

Many a boy or girl has been carried away, never to come home again. When you are going to cross a street stand and look both ways and then think of your folks at home and how they would feel if you were hurt or killed. Always think of that when you are asking yourself a question about danger, and after you have thought it all over in your mind perhaps you will decide not to do that dangerous thing.

A railroad crossing is another dangerous place. If you hear the train whistle, near at hand, do not dart out into its path to see if you can't get across before it comes. Stay where you should and you will live longer on this earth than if you went into the path of that oncoming train. If you follow this little bit of advice you will probably be a member of the Big Brother Club longer.

SAFETY-FIRST MAXIMS

By Joseph Zimerman, Revere

1—Do not cross railroad when gates are down.
Do not walk on tracks to take a short cut.
2—Look both ways before crossing the street.
Look to the left, then to the right.
Take no chances.
Accidents happen very quickly.
3—Watch the signals of the traffic officer.
Obey those signals.
4—Do not spit on sidewalks or floors.
Spitting spreads disease.
Think of others—keep others safe.
5—Do not push in a crowd.
Others may be hurt because you are careless.
6—The rule of the sea is "women and children first."
Let this be the rule of the land.
A real man is gentle with women and children.
7—Do not throw down a lighted match.
Fire starts easily, it is not easy to stop it.
Fire destroys property and life.
8—Never point a weapon toward anyone even in fun.
9—Do not jump from or onto moving trains.
The time saved is not worth the risk.
10—Save money wisely. Hard times may come. Look ahead.
Make yourself and your family safe.

BE CAREFUL ABOUT ACCIDENTS

By Francis Coleman, Melrose

No matter how smart and intelligent we may be there is always danger all around us. It pays us to keep our eyes open and watch out. In crossing a street we must stop and look both ways for automobiles or street cars. In getting off a street car we must be careful in running ahead of it, for fear that another car may be coming.

We also must be careful in crossing or trying to cross the railroad track when trains are in sight. We must always wait until the watchman raises the gates. We must not play on the railroad tracks for fear our feet might get caught in the rails. We must look out and never place anything on the tracks to endanger the lives of those on the train.

If people would be more careful there would not be so many accidents.

SAFETY

By Anita Drew, Medford

The word that rings out through life is safety. Many people have been crippled for life and many lives lost because this word meant nothing to them. All sorts of horrible stories have been told about automobiles trying to beat the trains but the trains nearly always beat them. Here is how we can prevent accidents. When we are down at the railroad station and see the bars go down, it is up to us to keep little children that like to creep under the bars away from them.

An engineer is a very careful man, but how is he to look after the train and still look out for little children that have no business on the tracks? Some people say when a child is hurt, it is the engineer's fault. Is it? Of course it isn't. What right has a child crossing the tracks when a train is ng? Not only children, but some grown- are foolish. There is no excuse for them they are old enough to look after them- ves.

Every day when we look at the paper we ee that people have been seriously injured nd we shiver at the thought of something like that happening to us and yet when we go out we don't seem to think what might happen if we did not watch our step. When we go down to the railroad station we see that warning sign which says: Stop, Look and Listen. I am sure if we all follow that sign and do our best to prevent accidents that so many people wouldn't suffer.

10-CENT FARE IN 1886

Examination of a card showing rates of fare in 1886 in this vicinity discloses interesting facts regarding the fares. On the "Medford-Malden Circuit" some of the fares were as follows:

Between Boston or Charlestown and line of Medford and Malden	10c
Between line of Malden and Medford and Somerville	8c
Between Medford Square and Charlestown or Boston	8c
Between Malden car station and Boston or Charlestown	8c
Between Everett and Charlestown or Boston	6c
All way fares	5c

In 1886 the purchasing value of the dollar was $1.25, whereas today it is 69 cents, as compared with par in 1913. A 10-cent fare in 1886, therefore, was equivalent to a little over 18 cents today. This does not allow for the great improvement in service and added distance which has been made possible by modern transportation.

FORGET IT

Pass a little grievance by,
  Don't appear to heed it;
Be as helpful as you may,
  Kind to those who need it.
Never flatter, never try
  Skilfully to wind them
To your own peculiar view—
  Take them as you find them.
—*Exchange.*

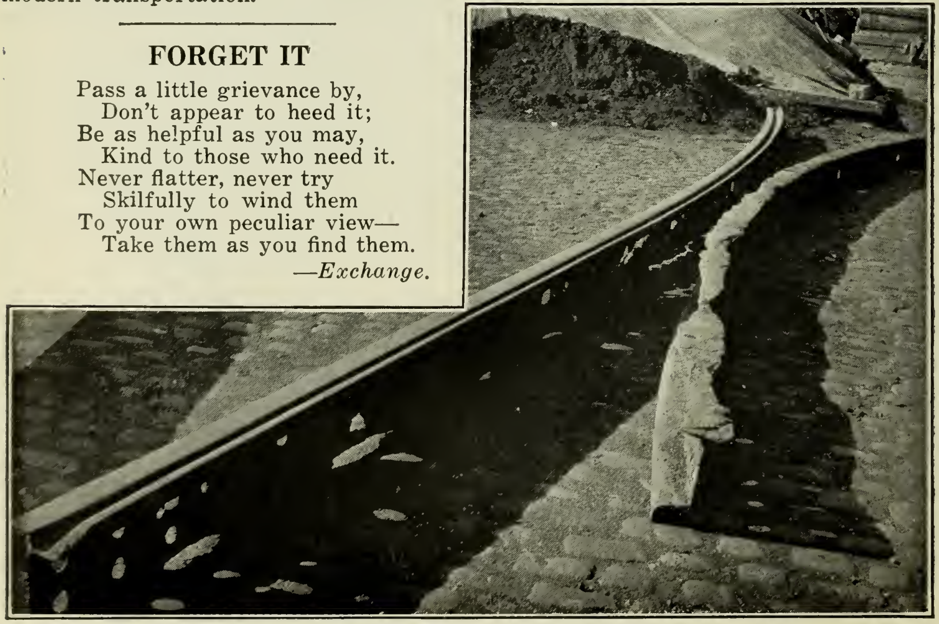
A CAUSE OF OCCASIONAL RAIL FAILURE

The accompanying illustration shows two pieces of curved rail that were badly corroded. In this case the rail base, buried in the ground, was almost gone.

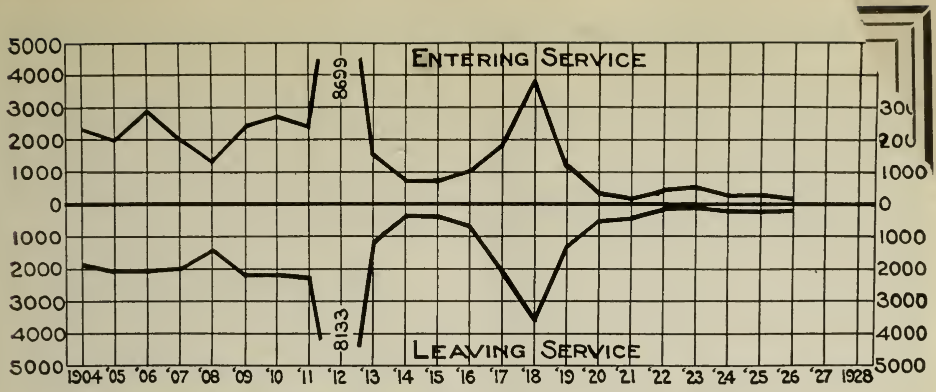
It should be understood that these rails had been in the ground a long time, and they were located near the South Boston power station at the end of a line where the track enters the North Car House from P street.

The rails are of girder guard Johnson section, originally 8-25/32 inches deep and weighing 117 pounds per yard. They were laid in 1896, and for twenty-three years were in heavy service. In 1919 changes in track layout occurred which resulted in lighter service on these rails, but they continued in use until recently, when they were removed after thirty years of service.

Before removal their condition was only suggested by the loose condition of the adjoining paving. The top surface showed only normal wear.



CORRODED RAILS REMOVED AFTER THIRTY YEARS OF SERVICE



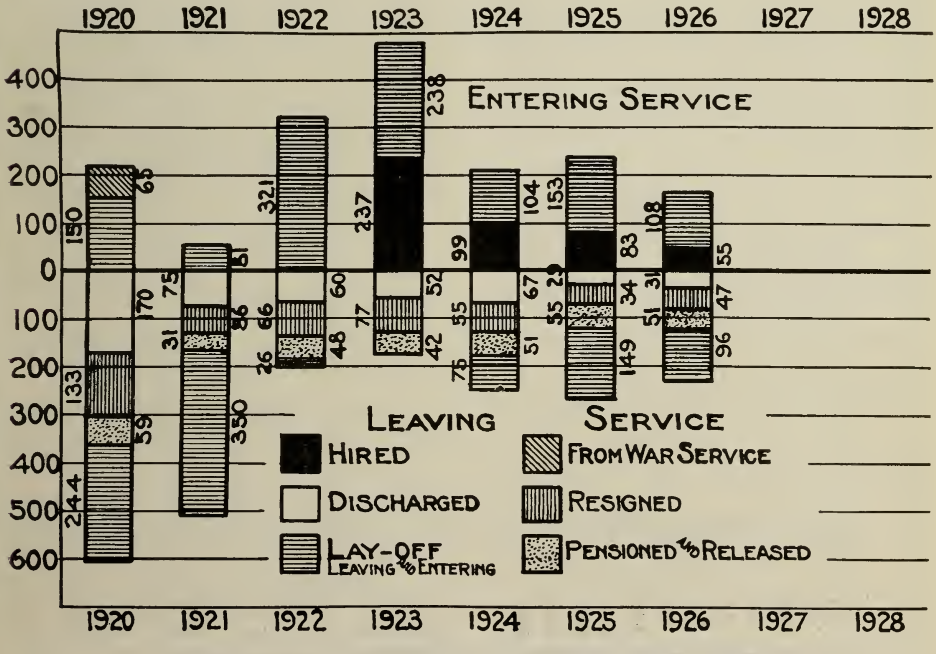
BLUE-UNIFORM MEN ENTERING AND LEAVING THE SERVICE

COMPARATIVE EMPLOYMENT RECORD FOR 23 YEARS

Why is it that the blue-uniform men do not come and go as they did twenty years or so ago on this property? This question is suggested by a study of the chart above. It will be noted that on the average about 2,000 men entered the service and as many left each year before 1911. Since the war, and counting from 1920, when conditions had settled down in stable form, the average number entering the service has been 238, and the number leaving has been 318 each year. Omitting the seasonal change in the force due to the demands of the service the average falls to 77 for those entering and to 184 for those leaving the service.

The diagram below shows the subdivision of the totals into classes. These are given on a large scale and will repay careful study. For example, it is interesting to note how the number of employees pensioned and released has settled down to a little over fifty a year, or say 1¼ per cent a year. This is about twice the average for the period from 1904 to 1911.

The charts shown on this page supplements the one printed in the May, 1926, issue of "Co-operation." The form has been changed so as to enlarge the scale of the details, to render them easier to read.



DETAILS FOR ABOVE CHART FOR PAST SEVEN YEARS

HAVE MORE THAN ONE TIMETABLE?

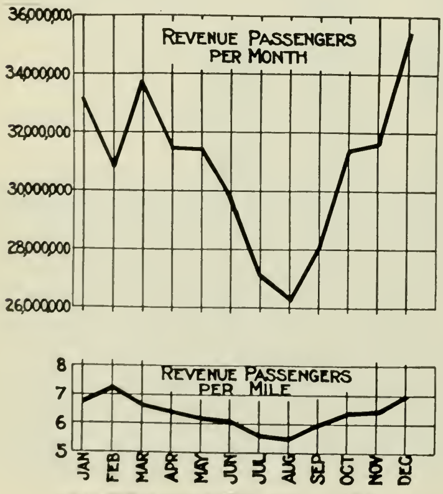
Someone asked recently the reason for the use of summer timetables by the Railway, reducing the service at a time when the weather is good and the people likely to ride. The answer to such a question can best be given by calling attention to the accompanying chart which shows the passengers carried, by months, during 1926.

It is clear that the car riding falls off during the summer, reaching a minimum in August, when there were only 26,381,206 passengers carried as compared with the peak of 35,474,895 passengers in December. This difference can be emphasized by putting it into the form of percentages. Thus there were 25.6 per cent fewer passengers carried in August as compared with December, or 34.4 per cent more carried in December as compared with August.

Theoretically the number of miles operated per month should be varied in accordance with the passengers carried, that is, the passengers carried per mile should be uniform. In practice this cannot be done, but a compromise is worked out in the summer timetables.

Suppose that the service was adjusted exactly to fit the volume of traffic. Then the number of employees required would vary in about the same way. The fact is, however, that whereas there were 4571 employees in car and train service at the peak there were actually 4,278 in service at the lowest point. The difference is but 293, or 6.86 per cent as compared with a traffic difference of 25.6 per cent. With a proportionate reduction in service, 3400 employees could have furnished the service in August.

Few people realize the seriousness of the problems which are presented in the transportation business by the seasonal fluctuation in traffic. The condition is analagous to that in other lines of business or of industry which are active at one or more seasons and dull at others. In many of these the workers are laid off in the dull seasons in large numbers and do not calculate on having continuous work throughout the year.



SUMMER TRAFFIC IS LIGHT

NEW ELEVATED CARS

(Concluded from page 55)

the car instead of in pockets in the sides as on all previous Elevated cars. The passenger doors are operated by electricity instead of compressed air as in earlier cars.

The roof is of the semi-arch type instead of the monitor type regularly used on other Elevated cars.

The lighting will be furnished by ten pendant-type lamps with opal glass reflectors, arranged along the center line of the car in the upper deck.

Other furnishings consist of sanitary hand-holds; electric heaters in the cabs; wood-slat seat "cushions" and backs; four new-type "Order-of-Stations" signs distributed so as to be visible from all seats, and destination signs of the roller-curtain type mounted in the windows, with the car number. at diagonally opposite corners. The destination may be read from outside or inside the car. The cars are being painted with standard colors inside and out and all sashes are of metal equipped with sanitary corners.

Genius is the capacity for taking pains.—*Napoleon.*

One way to keep your friends is not to give them away.—*Commonwealther.*

Better a little wheel that is turning than a big wheel standing still.—*Commonwealther.*

Don't take rumor at its face value, treat it like a check; be sure it is genuine before you endorse it.—*Commonwealther.*

Try to do to others as you would have them do to you—and don't get discouraged if they fail sometimes.—*Dickens.*

What Do You Know About the "El"?

THE following questions supplement those printed last month. The answers to last month's questions are given below the new questions.

26. What was the cost of labor on this property in 1926?
27. In which months of 1926 did the cost of service exceed the revenue?
28. How many buses were being operated by the Railway on Dec. 31, 1926?
29. Name the superintendents of the transportation, power, maintenance and rolling-stock and shops departments.
30. What was the percentage of increase in investment in the "El" from 1897 to 1926?
31. How many were the rides per capita on the "El" system in 1926?
32. How many tons of coal are burned per year in the "El" power plants?
33. What is the average cost of power to operate a car one mile on this system?
34. What was the ratio of operating expense to operating revenue on the "El" in 1926?
35. What is the operation known as "broaching" which is performed in the shops on bearings, etc.?

ANSWERS TO LAST MONTH'S QUESTIONS

1. Over $600,000. (Trustees' report.)
2. About $10,000,000.
3. $159,025,142. (Trustees' report.)
4. State, $7,964,000; City, $40,726,584; Railway and leased lines, $110,334,557. (Trustees' report.)
5. Courtesy, safety, waste elimination, teamwork.
6. $1,107,064. (Trustees' report.)
7. About 7½ per cent.
8. No. 5, semi-convertible surface car.
9. $500,000.
10. Right of condemnation, high capitalization, monopolistic character, service must be furnished when requested.
11. $105,100.
12. A fund used for the purpose of making good any deficiency in income or reimbursing the Commonwealth when the fund exceeds $1,000,000 on June 30 of any year. It also serves as a barometer to determine the rate of fare.
13. Greater by $404,000.
14. About 55 per cent greater.
15. Special service (at 25-cent fare without transfer privilege) from Brookline (Coolidge Corner) to the business district via Beacon Street.
16. Feb. 24, 1922.
17. Slight increase, indicated by January and February figures.
18. $35,481,313 in 1926.
19. Three hundred and seventy.
20. About $200,000.
21. Messrs. Samuel L. Powers, Winthrop Coffin, Stanley R. Miller and J. Frank O'Hare.
22. Mr. Powers.
23. A new traffic artery in Somerville and Cambridge, designed to relieve congestion from Boston northeastward. Built under Act of Legislature, partly at State expense and partly at expense of cities benefited in proportion to benefit. The Elevated spent about $250,000 for work in connection with this improvement.
24. Fatigue or crystallization.
25. One hundred and twelve.

CHANGES IN THE RESERVE FUND

Fiscal Year 1925-26

July 1, 1925, $1,000,000

July	$249,477.93*	Jan.	$223,30190†
Aug.	367,593.94*	Feb.	185,989.63*
Sept.	176,763.97*	Mar.	161,772.65†
Oct.	117,703.96†	April	77,031.69†
Nov.	45,265.00†	May	57,010.06†
Dec.	289,347.71†	June	1,662.18*

Profit and loss credit....$32,359.07

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	$393,028.41*	Jan.	$186,947.50†
Aug.	451,546.79*	Feb.	92,018.37†
Sept.	236,543.80*	Mar.	256,586.83†
Oct.	2,723.19†		
Nov.	29,302.22†		
Dec.	234,879.91†		

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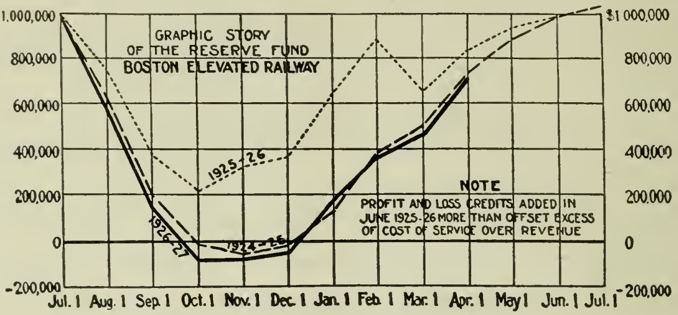
†Excess of revenue over cost of service.

*Excess of cost of service over revenue



MARCH OPERATION

GENERAL FINANCIAL DATA	1927	1926
Revenue exceeded cost of service	$256,586.83	$161,772.65
Operating revenue per car-hour (A.E.R.A. std.)	6.28	6.06
Operating revenue per car-mile operated	63.71c	62.94c
Average fare per revenue passenger	9.213c	9.220c
Ratio operating expense to operating revenue	67.37%	69.11%
PASSENGERS CARRIED		
Revenue passengers	34,320,672	33,802,662
Per cent 5c and 6c passengers	19.05%	18.89%
Revenue passengers per car-mile operated	6.714	6.699
OPERATING FACTS		
Trips operated	656,758	657,949
Car-miles operated:		
Rapid-transit lines	1,363,956	1,314,366
Surface, two-man	1,925,146	2,173,463
Surface, one-man	1,330,443	1,198,938
Express, newspaper and sprinkler cars	——	7,241
Motor bus	492,165	351,634
Total miles operated	5,111,710	5,045,642
ACCIDENT DATA		
Accidents per 10,000 car-miles	1.60*	2.17*
Accidents per 10,000 bus-miles	1.85*	2.87*
Revenue passengers carried per reported accident	21,720	18.050
Average number of witnesses per accident	3.31	3.59
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	9	13
Employees complained of by car riders	147	121
Car defects reported per 10,000 car-miles	4.0	5.2
INFORMATION ABOUT POWER		
D.c. kw.-hr. output gross per month	24,441,980	26,938,045
Maximum kw. load	85,280	82,920
Tons of coal consumed for power	20,749	22,765
Lbs. of coal for power per d.c. kw.-hr. at cars	1.906	1.897
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	0.861c	0.897c
Per revenue car-mile	4.22c	4.83c
Kw.-hr. per revenue car-mile	4.900	5.379

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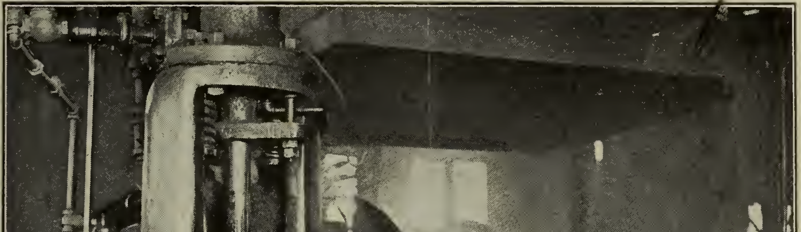
*This does not include miscellaneous accidents or derailments.

April 25, 1927.

EDWARD DANA, *General Manager,*

Volume 6 MAY, 1927 Number 5

Boston Elevated Close-Ups



THE BLACKSMITH
(See Page 71)

To All 'El' Employees

❧

WHY is it that transportation as a life work takes such a strong hold on those who once really get into its spirit? That there is a fascination about it is attested by steam railroad and electric railway men alike. Possibly it is the variety of the work that makes the appeal, or the opportunity to meet people, or the continuous employment, or the opportunity for advancement, or something else.

❧

Whatever the reason, railway men stick at the job. Early this month twelve men who have been with the company for over fifty years met with the general manager to celebrate this fact. That they have enjoyed their work was attested by their reminiscences, told with a relish. Many a younger man now in the service is living the incidents now which he also will relate with zest when he passes the 50-year mark.

❧

FIFTY YEARS OF SERVICE
IS A RECORD TO BE PROUD OF

Edward Dana

ELEVATED'S SECOND AUTOMATIC SUBSTATION

When Demand for Power for Everett Shops Exceeds Capacity of One Frequency Converter a Second Converter Is Brought Into Action—Equipment Is Protected Against Failures

IN the April, 1925, issue of "Co-operation" appeared a description of the Railway's first automatic substation, at Oak Square, Brighton.

In February of this year another substation was made automatic. This station is located on Broadway, in Everett. It furnishes power for lights and motors in the Everett shops.

The equipment at this station consists of two 13,200-volt, 3-phase, alternating current cables which supply power to two frequency converters of 750 kilowatts and 500 kilowatts capacity. These units change the incoming 13,200-volt, 25-cycle power to 550-volt, 60-cycle power.

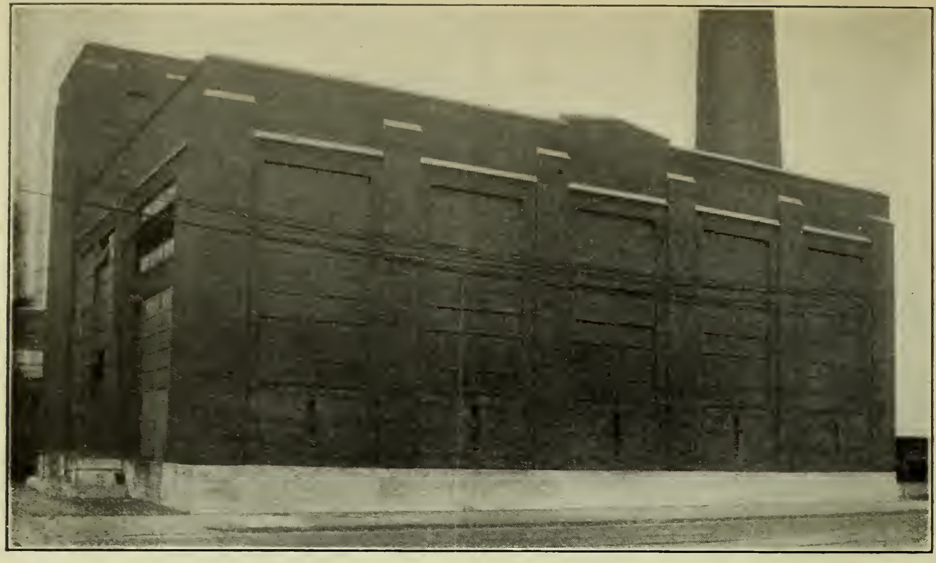
This power is fed from the station to the shops through four No. 000, 3-phase cables, where it is again redistributed to a switchboard in the shops. The power for lights is reduced through transformers from 550 volts to 110 volts alternating current.

The automatic installation at the Everett power house differs from that at our Oak Square substation in that the feeder switches, if opened from overload, do not automatically reclose, but must be closed by hand. Nor is the control of the station supervised from a remote location as is the case at Oak Square.

The operation of this automatic substation is based on a system of relays, which, by opening or closing as the load demands, cause the frequency converters to operate. These do the work formerly done by operators.

As this is a 24-hour station, one machine is in service continuously. The second unit goes into service when the load on the first unit has exceeded the rated capacity of the unit for twenty consecutive seconds, and automatically synchro-

THESE MOTOR-GENERATOR SETS AT EVERETT POWER STATION ARE CONTROLLED AUTOMATICALLY



ATTRACTIVE EXTERIOR OF POWER STATION AT EVERETT

nizes with the converter in service. When the load drops to such an extent that only one unit is required, the second unit automaticaly shuts down.

With automatic control, the protection given to electrical equipment is much greater than in the case of manually operated stations, where dependence is placed on the alertness of the operator. In the automatic stations relays are continuously on guard to protect against trouble, and when troubles do occur the relays operate much more quickly than would be manually possible.

The automatic equipment at this station affords protection against starting on single or reverse-phase rotation, alternating current under-voltage, and over-voltage, incomplete starting, underspeed, field failure, wrong phase rotation, overheated machine windings, hot bearings, flashover or grounded windings and high-tension or low-tension alternating current overloads.

The time to study accident causes is before accidents happen. It's better to cause a delay than an accident.—*Commonwealther.*

BOWLING LEAGUE BANQUET

The Boston Elevated Bowling League closed its 16th year with a banquet at the Instruction School, on April 26. A total of 115 men were present, including the following guests: Edward Dana, general manager; James Smith, sup't. of transportation; John Lindall, sup't. of rolling-stock and shops; J. H. Moran, general auditor; H. M. Steward, sup't. of maintenance; E. A. Kelley, ass't. to sup't. of transportation; H. H. Norris, educational advisor; L. J. Dickey, receiving cashier; H. A. Pasho, sup't. R. T. L.; D. D. Hall, ass't. sup't. R. T. L.; C. A. Bauch, sup't. Div. 1; A. W. Senter, sup't. Div. 2; J. H. Harrington, sup't. Div. 3; A. S. Scott, sup't. Div. 4.

Team prizes were awarded as follows: first, rolling-stock and shops; second, Div. 2; third, Rapid Transit Lines.

Individual prizes were awarded to the following: Messrs. J. McCarthy, R. T. L.; Hasson, Div. 2; Ritchie, R. S. & S.; Doherty, R. T. L.; J. McCrystal, R. T. L.; Olin, steel construction; Wilson, receiving dep't.; Hadley, Div. 2; Reardon, Div. 2; Potterton, Sullivan Square; Bunney, R. S. & S.; Rose, claim dep't. A traveling bag was presented to J. P. Banks, retiring secretary and treasurer, in appreciation of his six years of service.

After remarks by the general manager the following local talent entertained the gathering: Harold O'Neil, Frank Riley, Frank Powers, "Jimmie" Powers, "Tom" Hogan, Frank Cusick and James Murphy. These officers were then elected: President, Thomas Adams, Div. 3; secretary and treasurer, Edward O'Brien, Div. 2; scorer, Henry Olive, employment dep't.

A COURTEOUS BEARING IS A PERSONAL ASSET

That many employees of the Boston Elevated Railway realize the value of courtesy as a real asset to themselves is indicated by the replies to this question which was given in the 1926 accident-prevention examination:

Why does discourtesy on the part of an employee injure the railway for which he works?

Some selections from the answers are given below:

It creates hard feelings on the part of passengers. Often a passenger could be of great help to the Railway.

Courtesy is the best way to get friends and revenue for the Railway, just the same as with any business house in the country.

It gives the road a bad name and all the other employees a bad name, even though they may be the most polite men in the country.

The whole system is condemned for what the party sees on the particular car, as they (especially strangers) think that all are alike.

It discourages riding, causes ill-feeling toward all the rest of the employees, and when persons offended are in position to help the Railway they will not do so because of ill-will.

Because it lowers public opinion. In case of an accident, it makes the injured party resentful and makes witnesses indignant. Discourtesy breeds discontent in the riding public.

Because in time they get disgusted with us all and rather than put up with it, they go to the bother of writing complaints about us, and eventually they buy a car and we lose the revenue.

Because in the matter of securing witnesses it pays to have the good-will of your passengers. A satisfied passenger will prove a good witness. Courtesy helps to reduce complaints and enables the public to better appreciate service.

The mental impression left with an antagonized passenger is seed that will ripen into claims and suits and weld links in an endless chain of bitterness and dissatisfaction with the Railway, management and employees.

Because it gives people a bad impression. They sum up the whole working order of the Railway and come to a bad conclusion regarding the management of the road, which is not at fault. Courtesy is everything regarding the Railway.

Because he represents the Railway and if he is disagreeable and discourteous the result is unhappiness for himself and the road is reflected in a false light, and the passengers are antagonistic to the Railway. Courtesy makes for happiness and friendly relations.

The discourteous employee reflects discredit on the Railway for which he works, thereby making enemies for it; because being agent before the public his conduct discourages patronage and consequent loss to the road's revenue and standing as a public-service corporation.

Discourtesy by one individual reflects on the entire system. Not alone the Railway, but all his fellow-workers are included. The more a story is told the greater or more serious it grows and this is exceptionally true of matters of discourtesy.

A passenger does not have a good word for the Railway and at time of accident refuses to give name and stops other passengers from giving name. He oftentimes tries to get by without paying fare and passes the conductor big bills. All of this makes it hard for employees.

It leaves the passenger with the feeling that he isn't getting his money's worth, breeds a dislike to use cars unless absolutely necessary, and if a visitor from another city, gives the road and men a bad name. In case of accident, it increases desire of passengers to obtain damages.

As an employee represents the Railway, discourtesy causes ill-feeling towards the employee and the Railway. There should be good feeling and cooperation between the road and the public to make it a complete success. It also looks bad to strangers in a city who expect courtesy and service.

Because when persons are treated discourteously by employees they tell others about it and these others bear ill-will toward the road. They hope to be in some accident, small or large, where they can give vent to their outraged feelings, by bringing suit against the Railway. They will never give their names as witnesses to help them out.

It hurts the whole organization; for instance, if treated discourteously today tomorrow he may be a very material witness to an accident and even though the man who had the accident was a good fellow, that witness was lost by the discourteous act. The prestige of the Railway and the impression strangers get about it are judged by the courtesy of the men.

LONG SERVICE RECOGNIZED

On May 9 the general manager entertained at luncheon the twelve employees of the Railway who have been in the service fifty years or more. The accompanying autographs of the men present were written on a sheet of the trustees' paper by way of a souvenir and the photograph reproduced below was taken as a further reminder of the occasion. The dates of employment of the group were as follows:

T. Connell, June, '74, supervisor of timetables.
F. A. McAvoy, Mar., '75, asst. supvr. of t.t.
Edward J. Sweeney, Apr., '71, motorman.
Patrick W. Banks, June, '74, starter.
John Carl, Mar., '73, inspector.
G. A. Gilman, June, '72, inspector.
John Howard, May, '77, inspector.
Charles Seaver, Feb., '77, motorman.
Michael Long, Feb., '77, motorman.
H. W. Holbrook, Apr., '73, Jan., '83, gateman.
N. L. Dorr, Oct., '76, harness maker.
G. H. Robinson, '75, painter.

After the meal the company indulged in reminiscences of early days, one man referring to the time when the road had more than seven thousand horses. There are not more than a score of horses owned by the Railway today. Several of the men had begun work as "tow boys," a term unfamiliar to the present generation. A "tow boy" drove one horse and was stationed at the foot of a grade. When an overcrowded car came along he

Nauman L Dorr
Henry W. Holbrook
Frank A McAvoy
Charles Seaver
John Howard
Michael Long
T. Connell
E J Sweeney
Patrick W. Banks
John Carl
George A Gilman
George H Robinson

The 50-Year Club

(Please turn to page 78)

GENERAL MANAGER'S LUNCHEON TO 50-YEAR MEN

Sitting, left to right: F. A. McAvoy, asst. to supvr. of timetables; Chas. Seaver, motorman; John Howard, inspector; Michael Long, motorman; Timothy Connell, supvr. of timetables; Patrick W. Banks, starter; John Carl, inspector; G. A. Gilman, inspector.

Standing, left to right: G. H. Robinson, painter; Edward Dana, general manager; N. L. Dorr, harness maker; Edward J. Sweeney, motorman. H. W. Holbrook, gateman, also was present but does not appear in the group.

ELEVATED CLOSE-UPS

The Blacksmith

(See Illustration on Front Cover)

THE front-cover picture this month shows a blacksmith and his helper at work with a power hammer in the blacksmith shop of the rolling-stock and shops department at Albany Street. The work of these men and their colleagues can best be described in terms of the jobs performed by them.

In this shop are manufactured many of the repair parts used on surface-car equipment, and also forgings and tools used by other departments. It is equipped with many types of tools for both hand and machine forging. Some of the important tools are the steam hammer, the electric power hammer, the bulldozer, the forging machines, the combination shears and punch, the 100-ton punch-press, the cold cutting saw, the double-head threading machine, the drilling machine, and the electric welding machines. There are also eleven blacksmiths' forges and anvils for hand forging, six oil furnaces for heating material for the forging machines, bulldozer and power hammers, and a case-hardening furnace for hardening contact shoes, bolts, bushings, brakeshoe-hanger links, door rolls, valve stems, wrist pins, journal-box wear-plates, etc.

Case-hardening is done by packing the material in granulated raw bone and charcoal in steel carbonizing boxes made especially for this class of work. These are placed in the furnace and heated to 1700 degrees Fahr. After the heat has penetrated the material, the boxes are taken out of the furnace and allowed to cool. Then the material is again heated to 1500 degrees and quenched in oil or water to harden it.

The steam hammer has a wide range usefulness. Dies and forms are used with it for shaping up material and heavy welding is done under the hammer. It is also used for drawing out material from large to small size and straightening heavy bars. Most of our brake levers and radial bars are made under the steam hammer, which can strike a light or heavy blow as needed.

The work done at the electric hammer is much lighter, such as drawing out light material and making welds. The hammer works rapidly and is kept busy during working hours.

On the forging machines are made square, hexagon and flat-head bolts, gong pins, king pins, brake-hanger links, both flat and half-ball, heavy brake-rod jaws, and socket and fork wrenches. They are also used for upsetting material and for butt welding.

The bulldozer is a heavy-duty forging machine capable of a great variety of work. This includes making truck equalizer bars; shaping brake levers, journal-box wear-plates, truck-frame bars and third-rail contact shoes and hangers used on the rapid-transit lines; making pressed-steel conveyor buckets used by the department of power, pressed-steel journal-box covers, pressed-steel motor covers, and pole clamps and arms used by the wires and conduit division. Forms and dies are made for all work done on the bulldozer where we expect quantity production.

The 100-ton punch press is used for stamping out material, such as rail shims used in maintenance-of-way on the rapid-transit lines, journal-box covers and springs, trunnion tie-straps and girder-rail inserts.

Great saving of time, labor and material has been effected through electric welding, on such jobs as the repairing of gear casings in place of making patches, drilling and riveting. Building up of steel castings, such as journal boxes, brake-shoe heads and steel forgings; repairing of cracked and broken truck frames, and burning off rivets and bolts are all done by welding.

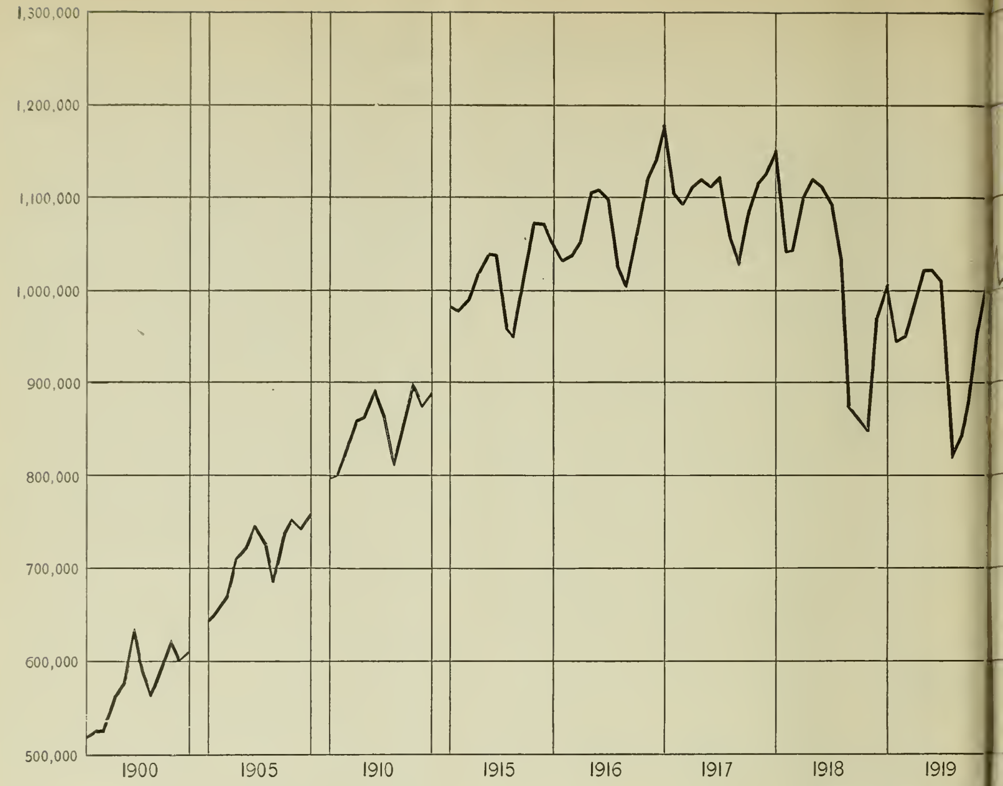
Work at the shears and punching machines takes the full time of four men shearing, punching and handling material used at forges, forging machines, bulldozer and power hammers.

Approximately 52,000 gallons of fuel oil is used each year in oil furnaces, and 300 tons of coal is used in forges and case-hardening furnace.

ANOTHER BOWLING LEAGUE BANQUET

The Boston Elevated Bowling League of the surface lines road department held its annual banquet and entertainment at the United States Hotel, Apr. 26, 1927, and it was an eminent success. The entertainment consisted of monologues, dancing, impersonations, and instrumental and vocal music, supplemented by a colorful jazz orchestra. L. J. Collins of Lenox Street, to whom fell the greater part of the burden involved, is entitled to every credit. The speakers were P. F. Corliss, trackmaster Div. 2; J. Leary, trackmaster Central Division; J. F. Callahan, supervisor of service cars; A. S. Weeks, and others.

You should be ve-ry careful, you know, you might get interested in your work and let your pipe go out.—*James McNeill Whistler.*



BOSTON E

AVERAGE WEEKD

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SEASONAL TRAFFIC SWINGS ON THE "EL"

Here is a diagram that shows at a glance some of the most important facts about the traffic of the Elevated Railway over a period of nearly three decades. At the left of the chart are shown the data for average week-day revenue traffic (including Saturdays) for single years 1900, 1905 and 1910. Then from 1915 on the record is continuous.

What are some of the things that stand out as we examine the chart?

1. From 1900 to 1916 the traffic grew steadily, more than doubling in this period.

2. Since 1916 the traffic has not increased as rapidly.

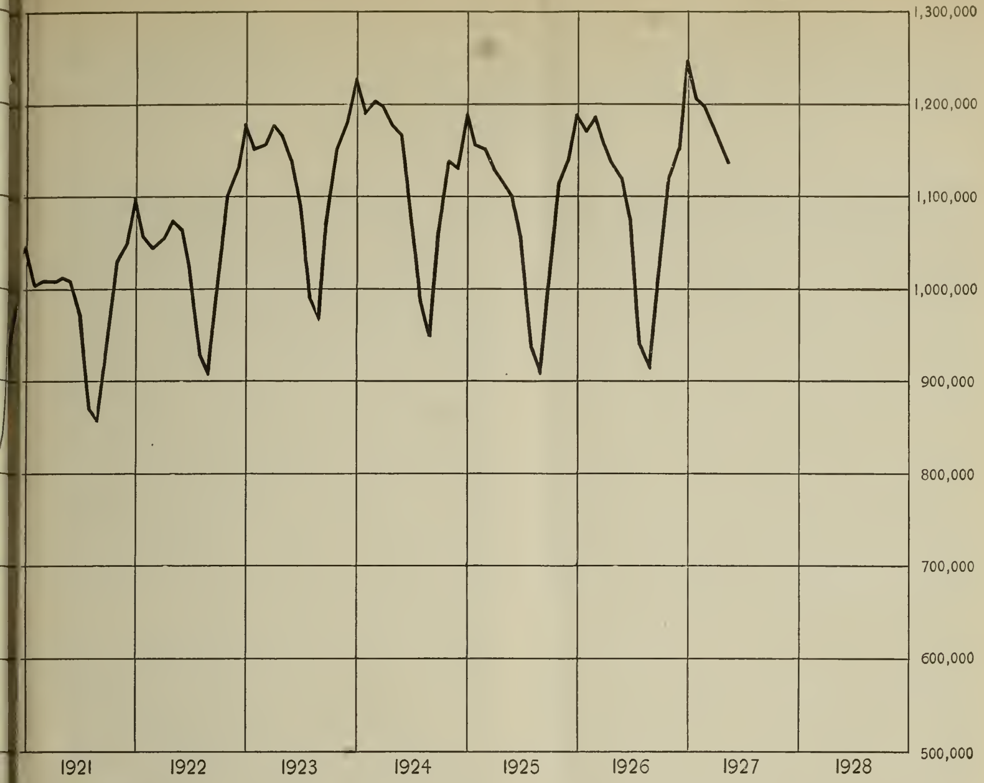
3. Just after the war period there was a slight falling off in traffic.

4. The seasonal swings were smaller in the earlier years than now. Thus the last swing, between August and December, 1926, was from about 910,000 to 1,250,000. This difference of 340,000 is 37.4 per cent of 910,000 and 27.2 per cent of 1,250,000.

Referring to the article on page 62 of last month's "Co-operation," it will be noted that for the same swing in terms of total monthly revenue passengers (which, of course, included Sundays) the respective percentages of swing were 34.4 and 25.6.

Back in 1900 the swing was 11.1 per cent of the low value of traffic and 12.5 per cent of the high. In 1905 the respective figures were 10.7 and 11.7 per cent; in 1910, 10.9 and 12.2 per cent; in 1915, 13.6 and 15.8 per cent, and in 1916, 15.2 and 17.9 per cent.

Now what do these figures mean? The obvious answer is that the greater the swing the more



) RAILWAY
NUE PASSENGERS
DAYS)

difficult it is to adjust the service to the seasonal requirements.

The principal explanation of this changed condition is that more people are using automobiles year by year. In 1900 the automobile was a luxury; now millions use them. In 1899, 3700 passenger motor cars were turned out by manufacturers; **in 1926 more than a thousand times that number were produced.** With the increasing popularity of the motor car the roads have been improved. Hence when good weather comes the motor cars are much in evidence to the detriment of the railway traffic. This, superimposed on the loss of traffic due to the increasing habit of giving and taking vacations and the closing of the educational institutions produces the summer falling-off in traffic.

Seasonal traffic swings are obviously a necessary evil.

A SUGGESTION IN GRAPHICAL FORM

The accompanying illustration was made from a suggestion of an emblem or poster which might possibly be used in advertising. A number of electric railways have such emblems and make considerable use of them. Have readers of "Co-operation" any other suggestions along this line?

A Suggested Emblem or Insignia

CAR OPERATION WITH LIGHT-WEIGHT MOTORS*

The Author Explains Why Modern Equipment Requires Different Handling From Older Types; He Also Gives Practical Hints for Keeping Down Maintenance Costs

By Henry S. Day

WITH the increasing demand for more economical car operation, the heavy types of car are rapidly being replaced by light ones. The competition introduced by the automobile has been a factor in this change.

With the light car has come the light motor. For example, the older type of Westinghouse motor, No. 101, of 40-horse power capacity, weighs approximately 2400 pounds, whereas the newer type, No. 514, of the same capacity, weighs approximately 1400 pounds. Besides being light, the No. 514 motor is superior in operating qualities, but it must be operated with due regard to the fact that it does not contain the metal, with the capacity to absorb the excess heat produced by unnecessary overloads, which was contained in the heavier motor.

With the older type of equipment no great harm was done if a controller was notched up too fast. The excess heat was absorbed by the heavy motor. The modern motor gives a smoother and quicker start when the controller is handled with judgment, that is when it is notched up at the proper rate. But if it is not, an armature or field coil is likely to burn out or a brushholder to "flash." The consequent cost of repairs may run anywhere from $25 to $150. The damage may not be evident at once, but it is there just the same.

Making a Good Start

A good start is necessary because:

1. The passenger must not be subjected to discomfort.
2. The motors need to be protected against excessive load.

A modern car should be handled like an automobile. No one would think of starting an automobile from standstill by shifting into high gear, but this is just what is done with a car when the controller is pushed from the "off" position to full multiple without pauses on the resistance points sufficiently long to give the current time to get the car rolling at the right speed. There should, of course, be no jumping of the car from notch to notch. Such jumping makes a jerky acceleration, with overload on the motors.

Then as to stopping, this should be done with the brakes and not with the motors. A car should never be reversed except in case of real emergency. Sometimes reversing is justified, but not often. Tests show that a car can be stopped better with the air brakes than by reversing. Reversing always injures the car and its equipment. I can say without hesitation that never has a car been reversed at a speed faster than a walk but it has sooner or later gone to the shop for repairs on that account. This fact can be appreciated if one stops to consider what it means to try to stop a 30,000-pound car by trying to keep the four motor armatures from turning. It can be done, but with the danger of skidding flat spots on the wheels, breaking pinions or gears, breaking or bending the armature shafts, wrenching the trucks and car body, etc. The least of these results will involve considerable expense in repairs.

Coasting is a good thing, but good judgment must be used here also. The kind of coasting that is obtained by going into multiple as rapidly as possible, so as to give the car a quick start, and then reaching the next stopping point at such a speed as to require an emergency stop is not good operation.

Then there is danger of producing a "flash-over" by going down a grade too fast with the power on. If a certain speed is exceeded, that is the "balancing speed," the motors are apt to flash over. The way to handle a car on a grade at all steep is to coast under control of the brakes at a speed sufficient to make running time but no faster.

Motor Troubles on the Road

Few of the troubles that may occur on the road can be repaired by the motorman, rather because the schedule time will not permit such repairs than because the motorman does not know how to make them. Temporary repairs can be made sufficient to permit the car to be moved in such cases as blown fuse, loose trolley pole, grounded motors, locked wheels and minor controller failures. Some suggestions along this line follow:

1. In replacing blown fuses it is essential to pull down the trolley pole, or pull the main switch if the car is equipped with one.

2. Loose trolley poles can usually be replaced in their sockets and bolted tight.

3. Although grounded motors cannot be repaired on the street, the disabled motor can be cut out. The disabled motor should first be located and then the pair of which it is

(Please turn to page 78)

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*Abstract at address delivered before Transportation Department Group Conference, F. L. Sennott, chairman, March 21, 1927. Mr. Day is manager of the transportation division, Westinghouse Electric & Manufacturing Company, Boston.

WHY ELECTRIC RAILWAYS HAVE ADOPTED THE MOTOR BUS*

General Manager of the Railway Explains to the Financial Public Why the Present Co-ordination Has Been Brought About and How the Bus Service in Boston Has Been Rapidly Expanded During the Past Few Years

IN any growing community there is a constantly increasing need for transportation of large numbers of people, or what has been termed "mass transportation." This form of transportation is and will for a long time continue to be furnished by electric cars. The railways, however, cannot extend their rail lines as rapidly as the communities might desire because the expense is too great. In general, the construction of track and all that goes with it costs so much at present prices that only when there is promise of heavy traffic at an early date is it practicable to make the necessary capital investment.

The automotive vehicle helps the railway to solve its problem of service extension and improvement without great outlay. It provides the railway with a flexible means of expansion which can be used experimentally if need be, whereas a rail line once laid down must remain in place for many years.

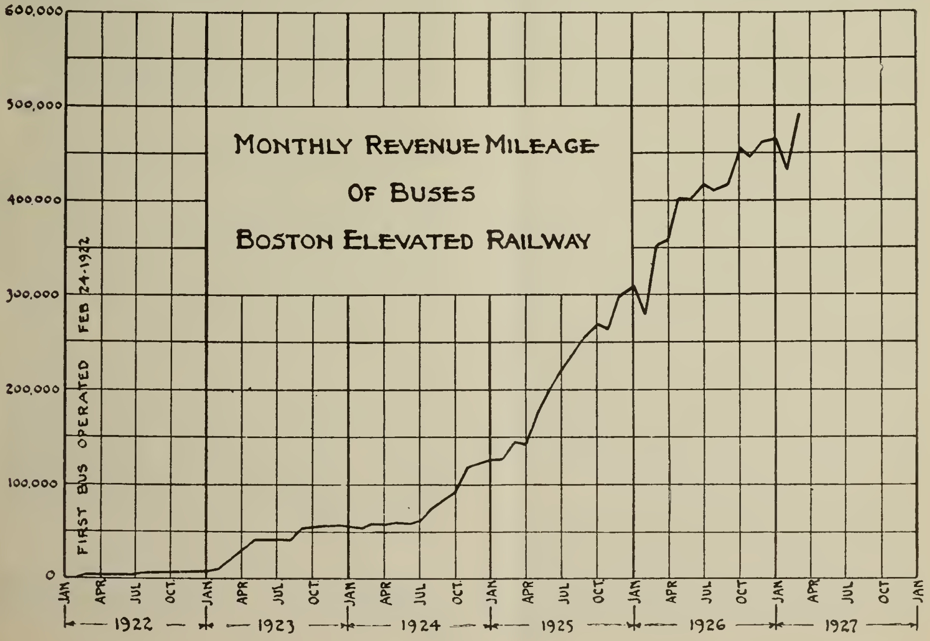
BUS ADOPTED CONSERVATIVELY

The electric railway industry has been criticised for its slowness in taking up the bus as an auxiliary. There is some justice in this criticism, although sound judgment lay behind the conservatism. The motor bus is a new vehicle, now in the stage of development where the electric car was twenty-five years ago. Rapid deterioration and obsolescence is to be expected of it. On the other hand, the electric car, while still far from perfect, is a reliable and efficient vehicle with well-understood characteristics. Hence there was a natural prejudice in favor of the railway car.

Another cause for conservatism regarding the bus was skepticism as to its ability to pay its way at practicable rates of fare. Much of the enthusiasm regarding the bus was instigated by salesmen with buses to sell. Their claims needed to be backed up with operating data. That this attitude on the part of electric railway managers was justified is proved by the operating data of numerous buses now in use on their properties. These on the whole produce little direct net income. They do, however, permit service to be extended and they obviate the necessity in some instances for the extension of rail lines into unprofitable territory.

DANGER OF OVER-ENTHUSIASM

While electric railways took up the motor bus deliberately they have now adopted it with enthusiasm. They may



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* Furnished by Mr. Dana for May 14 issue of "United States Investor" and reprinted by permission of that paper.

even be in some danger of going too far in their desire to give good service by extending bus lines beyond the economic limit. Statistics gathered and compiled by the Electric Railway Journal indicate that on Jan. 1, 1927, 333 electric railways were operating 7,749 buses in the United States and Canada. During the preceding year there had been an increase of 20 per cent in number of companies operating buses and of more than 40 per cent in the number of buses operated by them. One electric railway was operating more than 1200 buses.

At present about 16,000 miles of bus route are being operated by electric railways, which is more than one-third of the single-track mileage of all of the electric railways.

A significant sidelight on the situation is furnished by the large amount of space occupied by the bus exhibits at the last two national conventions of the American Electric Railway Association held respectively at Atlantic City and Cleveland. In 1925 the bus exhibits required 39⅓ per cent of the floor space, and in 1926, 36 per cent.

Buses in Boston

All of this development has come about within six years, and most of it within three years. The experience in this field of the Boston Elevated Railway, a pioneer in adapting the bus to city transportation conditions, illustrates the application of the bus in a conservative but comprehensive way. At present about 7½ per cent of all passenger vehicles operated by the Railway are motor buses as compared with 3 per cent in 1925. The monthly bus-mileage has increased as shown in the accompanying diagram from a negligible amount in 1922 (bus operation was inaugurated Feb. 24, 1922) to nearly 500,000 miles a month at present. This is over 9½ per cent of the total passenger-vehicle mileage.

These buses are rendering service auxiliary to the rapid-transit and street railway lines in three distinct ways: (1) Furnish service in new territory not previously supplied with transportation; (2) furnish service previously supplied by rail lines now abandoned; (3) furnish "owl" service at night after car operation stops. The usual fare on the buses is 6 cents, the same as that charged for short hauls on surface lines. This fare does not as a rule entitle the passengers to a transfer. If he desires such he pays the 10-cent fare, which gives him the use of all the Railway's transportation facilities.

Looking Ahead in Bus Transportation

It is useless at this time to form estimates of how far the bus is going in the line of its present development. It is not replacing the electric car on the Boston Elevated Railway or elsewhere, but merely supplementing it. The bus is taking care of that part of the increase in traffic which is due to tapping new territory, and will probably continue to do so in part for a long time to come. In the meantime, however, rail lines will be extended where business warrants and existing lines will be utilized more effectively. It is safe therefore to predict a healthy growth for motor-bus traffic on electric railway properties. Uneconomic competition from bus lines operated by other agencies will gradually disappear under the operation of the law of the survival of the fittest.

MR. DOWNEY SPEAKS AT CLOSING EXERCISES

The closing exercises for the fifth educational season of the Railway were held at the Instruction School, Sullivan Square, on Thursday, April 28, with more than three hundred in attendance. The general manager presided and introduced as the speaker Michael J. Downey, assistant superintendent of schools, Boston. Mr. Downey's topic was the importance of education as a continuing process through life. Each "commencement," he said, should be the beginning of the next step in education. The old idea of dropping education at the end of school days is now out of date. All efforts to maintain interest in this activity should be encouraged, such as those fostered by the State, the City, the workers themselves, and the business and industrial interests. Mr. Downey congratulated the employees of the Railway on their evidence of interest and on the accomplishment which they had already made.

The general manager awarded certificates as follows to 435 individuals:

G 1—Reading Courses		24
Foreman Training:		
G 2—First Year	60	
G 20 and 21—Second Year	71	
		—131
G 3—Current Events		10
G 4—Public Speaking		23
G 5—Business English		9
R 2—Automotive Maintenance		45
L 1—Electric Railway Law		10
G 6—Interdepartmental Accounts		80
Group Conferences:		
M 1—Maintenance Department	83	
R 1—R. S. & S. Department	60	
T 1—Transportation Department	95	
		—238
Total		570

A wartime motion picture, "The General," featuring Buster Keaton, was shown, after which a collation was served. Music was furnished by "Eddie" Fitzgerald's Orchestra. To use an old, familiar term—"a good time was had by all."

Anybody can get along pretty well without Homer or logarithms, but nobody can get along without tact.

HOW EDUCATIONAL COURSES ARE REGARDED

IN the selection of courses for next fall's program the opinion of those who have taken courses during the past year or two will no doubt have weight. This is true not only in regard to the action of the committee on education but also in assisting employees to choose courses best suited to their needs. Following are a few comments which speak for themselves.

Public Speaking

"The public speaking course enables one by study and practice to fearlessly and broadmindedly, and in a clear, concise manner, convey verbally one's thoughts to others."

ALBERT A. ORDWAY,
General Storekeeper.

"If you wish to broaden your mind, increase your knowledge, keep abreast of current events, and gain a world of confidence, join the public speaking class."

JOHN P. BANKS,
Supervisor, Transportation.

"The courses in public speaking given during the past two seasons were of so great worth that it would be impossible to do justice to their value in any statement. They were the best courses I ever took. The instruction and practice under competent supervision taught us how to talk effectively and gave confidence to speak in public."

HARRY W. PUTNEY,
Secretary Transportation Dept.

Foreman Conferences

"I regard the value of foreman training courses to consist in the following: It helps to encourage foremen to study their jobs, it creates a friendly feeling among foremen and it encourages them to discuss subjects in their own way."

J. M. PATTEN,
Foreman, Truck Shop.

"In my opinion, foreman training gives a keener, better knowledge of accident prevention; results in greater efficiency in meeting emergencies, and handling men and serves as an antidote for mental laziness and stimulant to the imagination."

FREDERICK N. WEEKS,
Inspector, R. T. L.

"Foreman training gives a foreman a thorough comprehension of the relative value of a man to his work and of the value of co-operation between the foreman and his men. It is of great economic value to a corporation."

JAMES F. LOTHROP,
Foreman, R. S. & S. Dept.

"In regard to foreman training, I feel that as the foreman is an indispensable factor in industrial organization, a course in foreman training should help him to secure a better appreciation of his responsibilities, make him a better leader and instructor and also a more efficient supervisor in his work."

OSCAR WEDERBRAND,
Foreman, Armature Shop.

Current Events

"The current events course has my hearty endorsement, as one which affords excellent opportunity to receive, from an expert, business and social news of the day in accurate, concise form. It seems to me a very satisfactory manner in which to keep well-informed."

LILLIAN E. STONE,
Head Stenographer,
General Manager's Office.

"In the current events course, current events of national and world importance were analyzed and presented to the class by Professor Miller in such a clear manner that the topics were read in the daily newspaper with greater understanding."

IRVING PRATT,
Cashier.

"The current events course is extremely interesting and instructive, as a 'close-up' of the outstanding events in the world's politics. It is highly educational and it is too bad that so many missed it."

WARREN E. FOOTE,
General Foreman, Power Dept.

Investing Savings*

"I am glad to express my appreciation of the course of lectures on investing savings, because there is not a doubt in my mind on the subject. My first reason for approval is that the subject was not restricted to any particular group of employees, but was completely all-inclusive. Secondly, the choice of speakers was particularly fortunate, because every lecturer was expert and gave every evidence of being up to the minute in actual practice methods. This combination produced an audience listening attentively to a lecturer who was well qualified to give them what they expected."

JOHN HAMILTON,
Chief Electrician, Maintenance Dept.

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*This course was not given during the season of 1926-27, but it is hoped that there will be enough interest to warrant giving it during the coming season.

LIGHT-WEIGHT MOTORS

(Concluded from page 74)

one should be cut out. The car should not be moved until this is done. The cut-outs on the controller are plainly marked. Running a car with a grounded motor practically results in destroying the windings and often the mechanical parts as well. The repair bill may run to several hundred dollars.

4. Locked wheels usually result from broken gears, pinions, armature shafts or axles. It is generally necessary to run the ar into the barn, skidding the wheels that are locked. The motors connected to the locked wheels should be cut out and the car operated from the other two. If the load is too much for two motors the motors should be again cut in and the brushes removed from the motor in trouble. This will leave three motors available for propulsion, which will usually be sufficient.

5. For controller failures it is usually necessary to send the car to the barn, but it is well to examine the controller. If the trouble is only a bent or stubbed finger a temporary adjustment can be made.

CONCLUSION

The men in the Transportation Department are in a position to effect tremendous economies by operating their cars in the best possible manner. They can do much to keep the cars out of the repair shop. The Boston Elevated No. 5 semi-convertible car is the best result of the efforts of the company's engineers and the manufacturers. It was designed and built to meet modern operating conditions, but it must be handled for what it is, a modern, light-weight car.

MUSICAL CLUB DANCE

About one hundred and fifty couples attended the second annual dance of the Boston Elevated Musical Club, at the Chateau Dansant on May 9. The music furnished by "Edie" Fitzgerald's orchestra was a feature of the occasion. The dance was in charge of the following committee: Harold L. O'Neil, chairman, assisted by Misses Mary Fitzmaurice, Alice McCusker, Helen McCusker, Kathlene McCusker, Alice Butler, Agnes Troy, Elizabeth McGrath, Mary Butler, Dorothy Twohig, Helen Sullivan, Catherine Flynn, Margaret Sullivan, Mary Flynn and Anna Twohig, and Messrs. Arthur C. Eaton, George M. Kelley, Robert H. Leahy, Jack Ryan, Frank Moore, Thomas Coffey and Thomas McNabb.

MARCH "CO-OPERATION" OUT OF PRINT

Boston Elevated Railway men and women who have copies of the March issue of "Co-operation" which they can spare will confer a favor by returning them to the general manager's office. This issue is practically out of print and about one hundred and twenty file copies are needed.

NEW PENSIONERS

Since the last roster appeared in the December "Co-operation" the following names have gone on the pension roll:

Patrick Connor, trackman.
M. J. Doyle, special officer.
A. Durnell, gateman, R. T. L.
J. E. Keefe, operator Div. 4.
J. F. Moran, warder R. T. L.
M. Mulkern, paver.
Miss E. C. Priest, clerk.
C. R. Proudfoot, clerk.
A. L. Russell, gateman R. T. L.
H. H. Spear, motorman Div. 1.
J. P. McCue, operator Div. 2.
A. H. Berry, warder R. T. L.
C. L. Husk, clerk Bureau of Audit.
C. T. Whalin, warder R. T. L.
W. M. Cameron, harness maker.
M. N. Chapman, motorman Div. 2.
T. Donovan, repairman.
R. C. Grant, painter.
T. Joyce, trackman.
Patrick Kane, trackwalker.
N. A. Lang, gateman.
James Main, starter R. T. L.
Charles McKay, armature winder.
B. E. Morehouse, gateman R. T. L.
E. A. Peterson, operator Div. 2.
G. H. Putnam, inspector R. T. L.

IN MEMORIAM

Thirteen pensioners have died since the last report. Their names and former occupations were:

F. F. McChesney, car cleaner.
Patrick Bulman, general helper.
W. S. Collins, yardmaster.
H. D. Mills, cash counter.
D. J. Curtin, conductor Div. 4.
T. J. Healey, carpenter M. of W.
J. J. Corbett, repairman.
D. O'Leary, paver.
Jos. McDonough, laborer.
Chas. Smith, motorman Div. 2.
G. H. French, gateman.
A. J. Hersey, motorman Div. 1.
C. L. Martin, painter.

The total number on the pension roll at present is 376, and the present outlay for pensions is at the rate of $215,812.08 per annum.

LONG SERVICE RECOGNIZED

(Concluded from page 70)

hooked his horse to it abreast of the span pulling the car and helped to pull the load up the hill. In the early days they were paid $6 a week for a seven-day week.

The general manager utilized the occasion to secure from the men their suggestions as to the solution of present-day problems. He hinted that on a later occasion the circle might be enlarged to take in the 45-year men.

A man's heart must be in his skill and a man's soul in his craftsmanship.—*Mabie.*

What Do You Know About the "El"?

THE following questions supplement those printed last month. The answers to last month's questions are given below the new questions.

36. For what purpose is the Railway using the new steel cars which are now being delivered?
37. What was the difference between the largest and smallest numbers of revenue passengers carried per month in 1926?
38. How many miles of trolley wire are required in the furnishing of service by the "El"?
39. What were the sources of the $37,000,000 expended by the Railway on plant improvements during the period of public control?
40. What prompted the school children to submit the safety compositions printed in recent issues of "Co-operation"?
41. How many snow loaders are operated during snow storms by the maintenance department?
42. What percentage of daily commuter traffic into and out of Boston is carried by the "El"?
43. What is the significance of the slogan, "A Ride a Day Keeps Poor Service Away"?
44. What was the average number of revenue passengers carried per week day during 1926?
45. What was the cost of accidents during 1926 in cents per car-mile?

ANSWERS TO LAST MONTH'S QUESTIONS

26. What was the cost of labor on this property in 1926?
Ans. $17,697,377.55.
27. In which months of 1926 did the cost of service exceed the revenue?
Ans. February, June, July, August and September.
28. How many buses were being operated by the Railway on Dec. 31, 1926?
Ans. Two hundred and thirty.
29. Name the superintendents of the transportation, power, maintenance and rolling-stock and shops departments.
Ans. James Smith, F. S. Freeman, H. M. Steward and John Lindall.
30. What was the percentage of increase in investment in the "El" from 1897 to 1926?
Ans. 530 per cent.
31. How many were the rides per capita on the "El" system in 1926?
Ans. Three hundred.
32. How many tons of coal are burned per year in the "El" power plants?
Ans. 230,759 tons in 1926.
33. What is the average cost of power to operate a car one mile on this system?
Ans. 4.4 cents per revenue car-mile in 1926.
34. What was the ratio of operating expense to operating revenue on the "El" in 1926?
Ans. 73.72 per cent.
35. What is the operation known as "broaching" which is performed in the shops on bearings, etc.?
Ans. It consists in forcing through a hole to be finished a tool of the proper form to give the hole the desired cross-section and to leave a smooth surface.

CHANGES IN THE RESERVE FUND

Fiscal Year 1925-26

July 1, 1925, $1,000,000

July	$249,477.93*	Jan.	$223,30190†
Aug.	367,593.94*	Feb.	185,989.63*
Sept.	176,763.97*	Mar.	161,772.65†
Oct.	117,703.96†	April	77,031.69†
Nov.	45,265.00†	May	57,010.06†
Dec.	289,347.71†	June	1,662.18*

Profit and loss credit....$32,359.07

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†Excess of revenue over cost of service.

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	$393,028.41*	Jan.	$186,947.50†
Aug.	451,546.79*	Feb.	92,018.37†
Sept.	236,543.80*	Mar.	256,586.83†
Oct.	2,723.19†	April	181,694.29†
Nov.	29,302.22†		
Dec.	234,879.91†		

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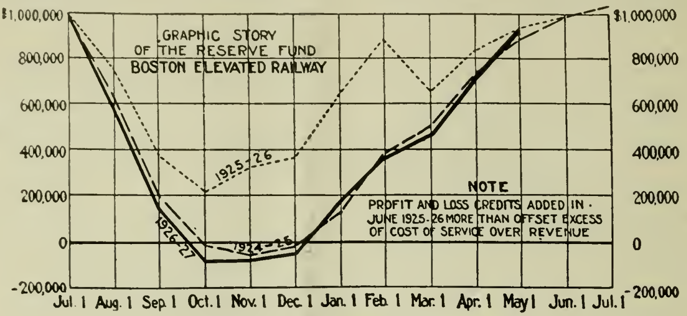
*Excess of cost of service over revenue



APRIL OPERATION

GENERAL FINANCIAL DATA	1927	1926
Revenue exceeded cost of service	$181,694.29	$77,031.69
Operating revenue per car-hour (A.E.R.A. std.)	$6.18	$6.03
Operating revenue per car-mile operated	62.24c	62.20c
Average fare per revenue passenger	9.256c	9.258c
Ratio operating expense to operating revenue	67.37%	70.42%
PASSENGERS CARRIED		
Revenue passengers	31,773,463	31,592,745
Per cent 5c and 6c passengers	18.13%	18.07%
Revenue passengers per car-mile operated	6.523	6.489
OPERATING FACTS		
Trips operated	625,795	633,156
Car-miles operated:		
Rapid-transit lines	1,281,984	1,262,557
Surface, two-man	1,836,541	2,057,118
Surface, one-man	1,282,281	1,182,598
Express, newspaper and sprinkler cars	———	6,536
Motor bus	470,171	359,732
Total miles operated	4,870,977	4,868,541
ACCIDENT DATA		
Accidents per 10,000 car-miles	1.79*	1.93*
Accidents per 10,000 bus-miles	2.38*	2.78*
Revenue passengers carried per reported accident	21,270	19,611
Average number of witnesses per accident	3.31	3.38
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	8	8
Employees complained of by car riders	91	104
Car defects reported per 10,000 car-miles	3.4	3.90
INFORMATION ABOUT POWER		
D.c. kw.-hr. output gross per month	20,057,220	21,604,205
Maximum kw. load	76,160	75,550
Tons of coal consumed for power	17,267	18,514
Lbs. of coal for power per d.c. kw.-hr. at cars	1.933	1.902
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	0.938c	0.916c
Per revenue car-mile	3.93c	4.06c
Kw.-hr. per revenue car-mile	4.186	4.434

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*This does not include miscellaneous accidents or derailments.

May 23, 1927

EDWARD DANA, *General Manager,*

BOSTON ELEVATED RAILWAY

CO-OPERATION

Volume 6 JUNE, 1927 Number 6

Boston Elevated Close-Ups

THE CAR-HOUSE REPAIRMAN

(See Page 91)

To All 'El' Employees

THE figures covering operation for May indicate that we are going to end the fiscal year (June 30) without a deficit.

IN OTHER WORDS—
WE ARE COMING THROUGH!

This is the result of co-operation all along the line. The spirit which has been shown during the year is appreciated by the management. Success through co-operation is equally gratifying to employee and employer.

Last September the reserve fund was overdrawn by approximately $100,000. It was $300,000 below the low level of the preceding year. Success in bringing the fund back to $1,000,000 has been due, in large measure, to co-operative effort resulting in economy through efficient operation.

TEAMWORK HAS DONE IT

Edward Dana

THE HEART OF THE "EL" POWER SYSTEM

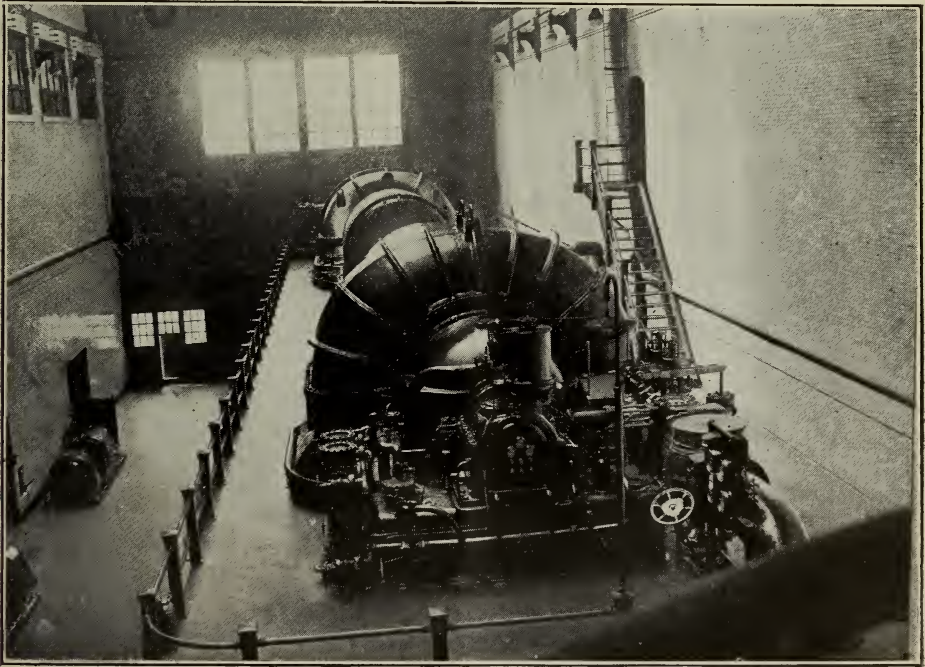
Latest Two Steam-Turbine Generating Units Have Combined Capacity of 100,000 Electrical Horse-power (75,000 Kilowatts). They Supply Nearly All of the Power Requirements of the Railway

DURING 1926 the two great horizontal steam-turbine units in the "El's" South Boston power station produced 91.9 per cent of all the alternating current output of the "El" system. The output was 255,905,600 kilowatt-hours. To furnish some sort of an idea of what this means, we can compare it with the monthly use of electricity by a family of ordinary size. If the lighting company charges us for more than, say, 35 kilowatt-hours we think the meter is running fast. Thirty-five kilowatt-hours a month is 420 kilowatt-hours a year. That is, these units would have supplied 610,000 customers, each using this amount of energy. As explained on page 85, the Railway is the third largest power producer in the country in its field, and these two turbines do most of the work.

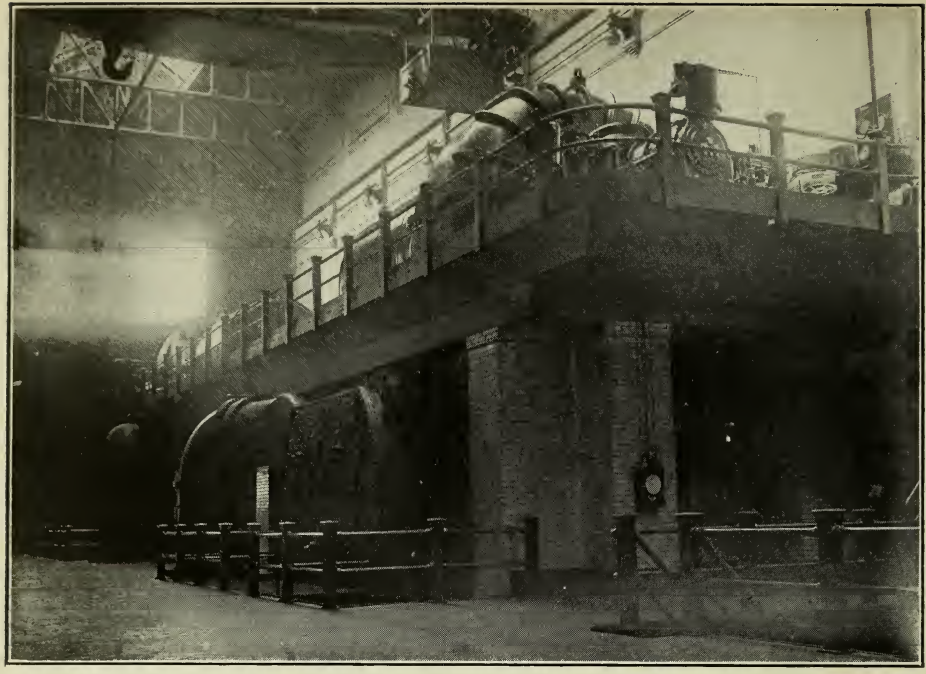
These turbines have not previously been pictured in "Co-operation." The accompanying illustrations are from recent photographs. Both units are of the horizontal, single-unit condensing type. In the illustrations the one nearer the reader has a rating of 40,000 kilowatts, while the farther has a rating of 35,000 kilowatts.

TURBINES AND CONDENSERS

Each installation consists of a steam turbine, direct-connected to a generator. Steam from each turbine passes through a surface-type condenser, in which, through the action of the cooling water in the condenser tubes, the steam is condensed. The water thus produced returns from the condensers through pipe lines to the boilers, where it is again converted into steam. In the illustration on page



THESE TURBINE UNITS CARRY MOST OF THE LOAD OF THE "EL" SYSTEM



THE CONDENSER FOR EACH TURBINE HAS A COOLING SURFACE OF 50,000 SQUARE FEET

84 one end of a condenser with the large pipe for the cooling water can be seen.

These steam turbines have each twenty bucket wheels, and are designed to operate at 1500 revolutions per minute. The generators are of the revolving-field type, and they supply 3-phase, 25-cycle, 13,200-volt alternating current to the transmission system.

The condensing equipment used in connection with each unit is of the cylindrical-shell, surface type. Each condenser has a cooling surface of 50,000 square feet and is designed for condensing a maximum of 400,000 pounds of steam per hour and circulating 50,000 gallons of water per minute. The condenser of the larger unit contains 9,580 tubes, of 1 inch diameter and 20 feet 2¾ inches length. The smaller unit contains 9.450 tubes of the same size. The tubes of both condensers if laid end to end would stretch over a distance of 72.9 miles.

The 35,000-kilowatt unit is the longer of the two, being 51 feet 10 inches in length. It is 20 feet 3 inches wide and 14 feet 8 inches high. It weighs approximately 585 tons, the weight of the largest single piece (the armature) being 95 tons. The 40,000-kilowatt unit is 45 feet 6 inches long, 20 feet 6 inches wide and 12 feet 3 inches high. Its weight is approximately 610 tons.

NEW BOILER IN COMMISSION

The first of the two new boilers authorized as part of the power department program of last year was for the first time put into actual service with other boilers in the South Boston power station on April 23, 1927. This boiler has a normal rating of 2075 horsepower and is equipped for the burning of pulverized fuel.

Details of this installation were given in an illustrated article in the December, 1926, issue of "Cooperation," page 155.

THE "EL" AS A POWER PRODUCER

Of all the electric railway power plants in the United States and Canada, including electrified steam railroads, the Boston Elevated Railway stood third in 1926 in capacity of generating machinery and in energy produced. The following table shows the standings of a few large producers:

Railway	Rating of generators K V A*	Energy produced in 1926 kilowatt hours
1. Interborough Rapid Transit Co.	390,000	1,063,717,242
2. Williamsburgh Power Plant Corporation‡	204,100	542,141,625
3. Boston Elevated Rwy.	182,000	257,696,595
4. Pennsylvania R. R. (Long Island)	85,500†	239,419,140
5. New York Central R. R.	90,000	205,603,658
6. Kansas City Public Service Co.	53,000	131,186,730
7. New York, New Haven & Hartford R. R.	66,080	130,996,250
8. Norfolk & Western Railway	45,000	106,425,052
9. Wilmington & Philadelphia Traction Co.	26,400	98,662,510
10. Twin City Rapid Transit Co.	75,000	98,318,323

*Kilovolt-amperes, the usual unit for rating electric generators.

‡Subsidiary of Brooklyn Manhattan Transit Corporation.

†Kilowatts.

The above table refers to power production only. The order would be different if purchased power were included. Large power purchasers were as follows:

Railway	Energy purchased in 1926 Kilowatt hours
Chicago Surface Lines	636,552,764
Philadelphia Rapid Transit Co.	308,080,719†
Pacific Electric Rwy.	187,975,148
Chicago, Milwaukee & St. Paul Rwy.	138,083,293
New York, New Haven & Hartford R. R.	78,662,620
Pennsylvania R. R. (Long Island)	47,114,624‡
Twin City Rapid Transit Co.‡	41,898,662

†Also produced 82,835,023 kilowatts.

‡See also preceding table.

In total energy consumed the "El" stands sixth in the list. Ahead of it in order are Interborough Rapid Transit Company, Chicago Surface Lines, Williamsburgh Power Plant Corporation, Philadelphia Rapid Transit Company and Pennsylvania Railroad (Long Island.)

WHAT WOULD YOU LIKE IN CO-OPERATION?

The purpose of "Co-operation" is to familiarize employees with happenings on the property, particularly with such information as they may find useful in their everyday work. It serves to record the development of the property and gives personal items where these merit general reading. It will be helpful in preparing the plans for future issues if employees will answer the following:

1. What types of articles in "Co-operation" do you find most interesting?
2. What types do you find most helpful in your everyday work?
3. Can you suggest any ways in which the operating data can be put into more interesting form?
4. Do you find interesting and useful the diagram form in which data are often put?

Just write your suggestions on a slip of paper and hand it to the next official whom you meet and he will, in turn, send it to the general manager's office, or you can send it direct.

CATECHISM ON KEEPING WELL

The general manager has received from the Boston Tuberculosis Association the questions printed below. They suggest facts which are important to everybody. The answers will be found on page 94.

1. Is night air harmful?
2. Is quinine a cure for colds?
3. How many times a day should a well person over 30 years of age eat meat?
4. Is a fat person always healthy?
5. How can you tell if you are healthy?
6. How many hours of sleep should a grown person get each night?
7. Is tuberculosis inherited?
8. What is called "Nature's most perfect food?"
9. How often should one's teeth be examined?
10. How often should one have a thorough physical examination?
11. What would you do for frequent headaches?
12. When can diseases be most easily cured?
13. Which is better for health, white bread or dark bread?
14. How much water should the average person drink a day?
15. What diseases can be prevented by vaccination or inoculation?

THE LITTLE WHITE COT

By D. H. Willett, Department of Accounts

Well do I remember a little white cot,
Where it stood on the side of a hill
With a rose-covered trellis, a flowery spot,
That shaded the walk to the sill.

I remember the path to the old swimming-hole,
Whither Dad all my footsteps could trace
And the print of his boot with a wooden-pegged sole
Often reached me in just the right place.

But now far removed from that little white cot
To a city of trolley-car fame,
When my vacation comes, I will hike for that spot
And swim in that old hole again.

To avoid that run-down feeling — "Cross Crossings Cautiously."

If you don't get on with certain people, let them alone.

MORE ANSWERS FROM THE ACCIDENT-PREVENTION EXAMINATION.

ALL of the questions in the examination papers on accident prevention held last year related to the fundamental principles of street-railway operation.

Do you not think the following answers are excellent and show that the men making them are good operators? These answers were selected from a number of the best papers:

QUESTION: Should you endeavor to obtain, as witnesses to an accident, employees of the Railway or persons who are not so employed? Give your reasons.

ANSWER: I try to get all that were witnesses to an accident so that the Railway can have enough witnesses to pick from. I try to get non-employees first as they do not understand the system as an employee does and a court likes a non-employee witness better.

QUESTION: What do you understand is meant by accident prevention and why is it so necessary in these days?

ANSWER: Accident prevention is a study of unsafe practices and conditions in order that men, women and children may be saved from injury, suffering or possible death; also to eliminate as far as possible damage to property. These conditions have been brought on to us by modern inventions, speeding us up to a rushing, dashing way of living.

QUESTION: What ought a motorman to do when his car is between streets where traffic is heavy and he hears the whistle of the fire apparatus and is unable to tell from which direction the apparatus is coming? Explain.

ANSWER: Stop at once; have conductor see just where apparatus is headed for and where it is coming from.

QUESTION: As your car is going along the street and you notice children playing in the street near the track, how should you operate your car and what else should you do?

ANSWER: Drive car very slowly so that in case child made a false move you can stop at once. If child is very small stop and put child in a safe place to be sure it will not get hurt. Sound gong steadily.

QUESTION: What does the ringing of your gong mean to the public on the streets or in vehicles.

ANSWER: A warning to persons that a street car is approaching and to watch out as I am watching out for them. It does not give us any right of way.

QUESTION: What do you understand reasonable speed means?

ANSWER: A speed at which I have car under perfect control ready to stop at a moment's notice. It depends on the condition of the rail, the weather, traffic on the street and pedestrians.

QUESTION: What are the main reasons for persons falling in the cars and what can you recommend that will tend to reduce such accidents?

ANSWER: Jerky starting and jerky stopping of cars. Speed around curves. Bundles, bags or suit cases on the floor that people might not see and would trip over. Instruct motormen to prevent, if possible, these occurrences.

QUESTION: State what you do to prevent injuries to your passengers caused by their crowding and pushing.

ANSWER: Announce "Please do not push," "Watch your step" and, in the case of elderly or lame people or children, "Take your time," and when I think there is danger to such I usually step between them and the crowd and help them.

QUESTION: Please state any thoughts or ideas which have occurred to you, after reading the accident-prevention papers, which would help to lessen accidents.

ANSWER: Watching out for side swiping or narrow-clearance collisions. Being careful about doors; also about women, children or infirm passengers, assisting them all I can and seeing them in a safe position before giving starting signal; watching out for approaching automobiles, fire apparatus, etc., near car at stopping places.

QUESTION: Many accidents occur on our Railway for which neither you nor any of our employees are at fault. Why is it necessary to make a report on such a case?

ANSWER: Accidents sometimes considered not worth reporting are often most serious, troublesome and expensive. Every accident, every unusual incident, presents the possibility of claim being made. Strict compliance with Rules 63 to 69 inclusive is to my mind the most sacred duty of a carman.

QUESTION: What do you do when a passenger who has had an accident in connection with your car refuses to give his name?

ANSWER: If there is a police officer I try to take his name through officer and also the officer's name but if there is no officer there I make out a report and get as many witnesses as possible and state in report that passenger refused to give name.

FURTHER COMMENT ON EDUCATIONAL COURSES

IN the issue of "Co-operation" for May several testimonials to the value of some of the courses in last season's program and earlier were printed. The purpose of these is to maintain interest in these courses so that other employees who might profit by taking one or more of them may be stimulated to do so when the opportunity for enrollment is presented in the fall. Following are additional testimonials selected from a larger number which have been received.

Current Events

"The course in current events gave me a better understanding of the worth-while topics of the day, thereby making my reading so much more enjoyable. I hope the course will be continued next year."

A. J. GUYON,
Supervisor of Employment.

"I enrolled in the current events course for the 1925-1926 season and found that it had a most enlightening and broadening influence."

E. R. KELLY,
Supervisor, R. T. L.

"The course in current events proved of great value in keeping me posted in a general way on the important occurrences of the business, social and political world. Owing to my own business and social activities it was not possible for me to take the time necessary each day to read about such matters, but by devoting one hour each week to a lecture outlining them I kept in touch with current activities."

ESTELLE M. JOHNSON,
Secretary to General Manager.

Foreman Training

"The different attitude the foremen have shown toward each other since this course began is very marked, indicating that it has promoted friendship and a better understanding among the foremen."

A. J. HAKANSON,
Foreman Carpenter,
Maintenance Dept., R. T. L.

"I found that the first course was very interesting and am sure that the second course, which I intend to take, will be more so."

F. J. BANKS,
Supervisor, Central District.

"As the subjects discussed at these conferences pertain to the actual problems which foremen experience each day, and as these problems are analyzed, the foremen who attend find that there are some things that are brought out in the discussion which benefit them in their work. I have benefited by attending these courses, as I have obtained ideas which I have put into practice, and have found that I get better results."

JOHN F. CALLAHAN,
Supervisor of Service Cars.

Public Speaking

"Before we can speak well, it is essential that we have something worth while to talk about. It was the necessity of acquiring additional information on various subjects that I considered the most valuable part of the public-speaking course. I profited not merely in my delivery but by the collateral reading which I found I had to do in order to interest others."

GUY H. TRESILIAN,
Conductor, Trans. Dept.

"The course in public speaking helps to give one poise, enlarges his vocabulary, and should help him to state clearly his views on any subject."

W. H. BURRELL,
Chief System Operator, Power Dept.

Investing Savings

"As a past member of the 1925 educational committee, I have been asked by several friends and co-workers if it was intended to have another course in investing savings. They expressed regrets that they did not take advantage of joining the class in 1925, and claim that they did not know just how interesting the subjects presented were, until they read the articles in 'Co-operation.'

"Personally, I received a great deal of benefit from listening to the several experts who so ably discussed their different papers presented and I am of the firm opinion that if such a course was repeated, we would have a much larger attendance."

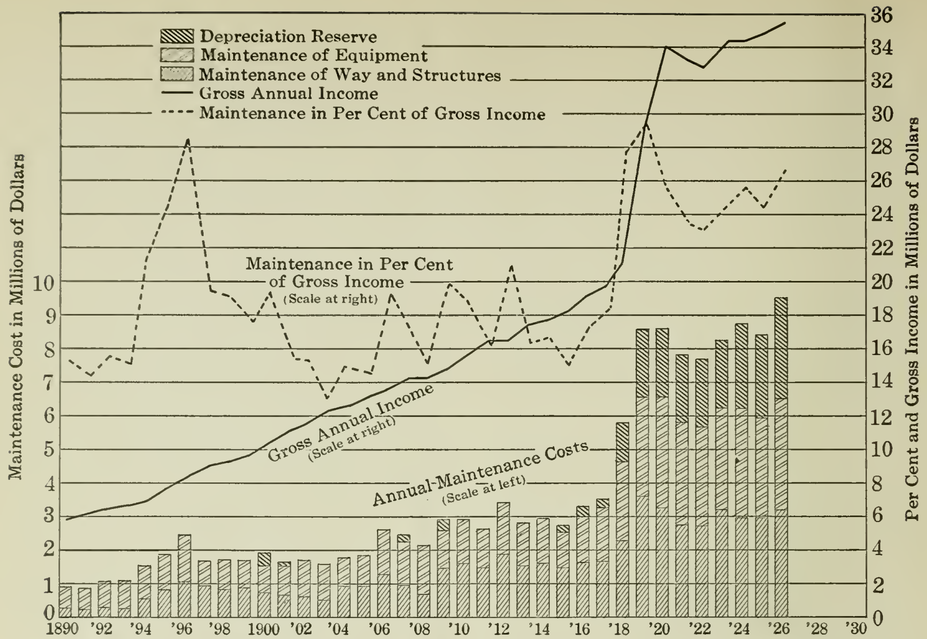
F. I. WILKINS,
Supervisor of Inspection.

"The investing savings course taught me the many ways and advantages of investment of savings together with the meaning of speculation, the advisability of getting expert advice, and of always doing business with a reputable concern or individual."

W. H. SULLIVAN,
Dept. of Stores, Albany St. Shops.

"This course was of great value because it showed how to invest money in safe ways and still get a reasonable return. It also emphasized the insecurity of stock speculation."

MARGARET M. GRIFFIN,
Nurse, R. S. & S. Dept.



THE RAILWAY'S MAINTENANCE EXPENDITURES FOR THIRTY-SEVEN YEARS

(See table below; also article on page 90)

BOSTON ELEVATED RAILWAY EXPENDITURES FOR MAINTENANCE

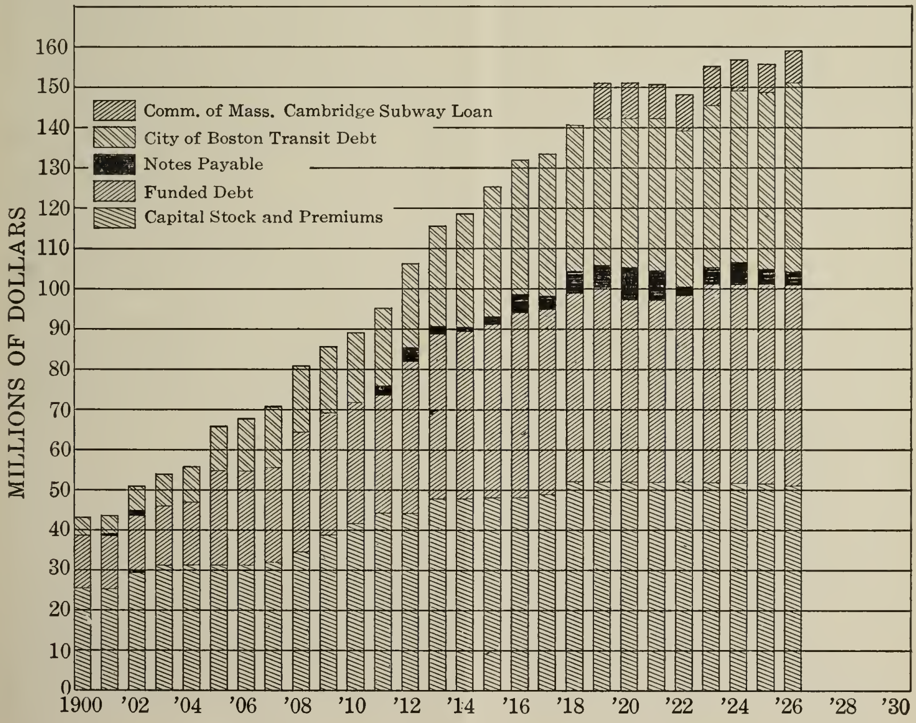
Renewals and Depreciation Account and Total Gross Income

Calendar	Maintenance of Way and Structures	Maintenance of Equipment	Depreciation Reserve	Total Maintenance	Total Gross Inc.	Per cent Maintenance to Gross Inc.
1890	$298,546	$598.911	......	$897,457	$5,904,196	15.2
1891	264,989	606,125	......	871,114	6,024,806	14.4
1892	316,087	697,173	......	1,013,259	6,452,089	15.7
1893	334,209	692,509	......	1,026,718	6,651,447	15.5
1894	595,902	914,242	......	1,510,144	7,032,158	21.4
1895	835,872	1,110,348	......	1,946,220	7,940,643	24.5
1896	1,031,886	1,372,316	......	2,404,202	8,435,465	28.5
1897	956,178	769,888	......	1,726,066	8,910,505	19.4
1898	829,831	932,322	......	1,762,153	9,242,948	19.1
1899	921,562	834,664	......	1,756,226	9,837,400	17.8
1900	789,647	883,441	300,000	1,973,088	10,260,388	19.2
1901	649,689	957,627	90,000	1,697,316	10,937,632	15.5
1902	652,410	1,124,877	......	1,777,287	11,453,372	15.5
1903	552,660	1,035,207	......	1,587,867	12,120,541	13.1
1904	942,692	919 433	......	1,862,125	12,425,795	14.9
1905	964,397	924,106	......	1,888,503	12,894,695	14.7
1906	1,311,409	1,346,479	......	2,657,888	13,745,564	19.3
1907	975,946	1,307.126	100,000	2,383,072	14,063,909	16.9
1908	704,640	1,419,028	......	2,123,668	14,183,622	15.0
1909	1,491,107	1,234,921	200,000	2,926,028	14,687,260	19.9
1910	1,689,454	1,232,889	......	2,922,343	15,630,562	18.7
1911	1,418,016	1,225,210	......	2,643,226	16,404,294	16.1
1912	1,916,338	1,487,813	......	3,404,151	16,400,085	20.8
1913	1,550,521	1,314,693	......	2,865,214	17,510,546	16.4
1914	1,604,147	1,366,246	......	2,970,393	17,910,175	16.6
1915	1,444,464	1,207,438	100,990	2,752,892	18,171,655	15.1
1916	1,601,288	1,408,645	320,000	3,329,933	19,376,357	17.2
1917	1,698,175	1,614,892	320,000	3,633,067	19,818,407	18.3
1918	2,312,932	2.368,012	1,184,670	5,865,614	21,062,692	27.8
1919	3,740,515	2,914,555	2,004,000	8,659,070	29,498,583	29.3
1920	3,209,275	3,469,486	2,004,000	8,682,761	34,031,636	25.5
1921	2,746,844	3,079,104	2,004,000	7,829,948	33,277,026	23.5
1922	2,714,653	2,898,566	2,004.000	7,617,219	32,699.176	23.3
1923	3,268,677	3,005,653	2,004.000	8,278.330	34,096,813	24.3
1924	2,949,524	3,347,432	2,496,000	8,792,957	34,175.320	25.7
1925	2,967,896	3,004,970	2,496,000	8,468.860	34,547,380	24.5
1926	3,249,086	3,355,150	2,841,722	9,445,957	35,481,313	26.6

BOSTON ELEVATED RAILWAY GROSS TRANSIT DEBT

Close of Fiscal Years 1900-1926

Year	Capital Stock and Premiums	Funded Debt	Notes Payable	City of Boston Transit Debt	Comm. of Massachusetts Cambridge Subway Loan	Total Gross Transit Debt
1900	$25,485,000	$12,866,000	.....	$4,750,000	......	$43,101,000
1901	25,485,000	12,866,000	$375,000	5,051,000	......	43,777,000
1902	29,683,310	14,666,000	500,000	6,001,000	......	50,850,310
1903	31,414,971	15,219,000	......	7,351,000	......	53,984,971
1904	31,689,171	15,981,000	......	8,434,000	.....	56,104,171
1905	31,689,171	23,477,000	......	10,490,700	.....	65,656,871
1906	31,689,171	23,475,000	......	11,990,700	.....	67,154,871
1907	32,399,677	24,467,000	......	13,570,700	.....	70,437,377
1908	34,526,928	29,967,000	......	15,570,700	.....	80,064,628
1909	39,197,103	29,967,000	......	16,460,700	......	85,624,803
1910	41,887,313	29,967,000	......	17,454,700	.....	89,309,013
1911	43,277,313	30,817,000	2,500,000	18,398,700	......	94,993,013
1912	43,473,783	38,571,000	3,600,000	21,292,700	......	106,937,483
1913	47,725,218	41,171,000	2,050,000	24,686,700	......	115,632,918
1914	48,095,752	41,710,000	1,150,000	27,595,700	......	118,551,452
1915	48,648,415	42,771,000	1,850,000	31,906,700	......	125,176.115
1916	48,648,415	46,066,000	3,660,000	33,708,700	......	132,083,115
1917	49,249,155	46,093,000	2,900,000	35,217,700	......	133,459,855
1918	52,249,155	47,008,000	5,143,000	35,899,700	......	140,299,855
1919	52,249,155	48,052,000	5,864,842	36,345,700	$7,868,000	150,379,697
1920	52,249,155	44,978,000	8,127,918	36,994,700	7,868,000	150,217,773
1921	52,249,155	44,965,000	7,561,617	37,558,700	7,829,000	150,163,472
1922	52,249.155	46,221,000	1,800,000	39,214,700	7,788,000	147,272,855
1923	52,177,005	49,221,000	3,934,172	41,243,700	7,746,000	154,321,877
1924	52,085,405	49,819,000	5,200,000	42,096,700	7,797,000	156,998.105
1925	51,973,805	49.819,000	2,800,000	43,585,700	7,749,000	155,927,505
1926	51,870,805	49,819,000	3,100,000	46,591,700	7,700,000	159,081,505



THIS CHART SHOWS THE SOURCES OF THE VAST SUM INVESTED IN THE "EL"

(See table above: also article on page 90)

Year	Capital stock and premiums Per cent	Funded debt Per cent	Notes payable Per cent	City of Boston transit debt Per cent	State of Mass. Camb. sub. loan Per cent	Total Per cent
1900	59.1	29.9		11.0		100.0
1910	46.9	33.55		19.55		100.0
1920	34.8	30.0	5.4	24.6	5.2	100.0
1926	32.6	31.3	1.95	29.3	4.85	100.0

"EL" FINANCIAL DATA "IN A NUT-SHELL"

The charts and tables on pages 88 and 89 give, in easily read and easily remembered form, some of the most important financial facts regarding the Railway over a long period.

The Maintenance Data

On page 88 are the figures and percentages for maintenance, plotted for comparison with the gross annual revenue. Maintenance at present requires approximately a quarter of the total income. This compares with about a seventh in the earlier years with the exception of a period thirty years ago when the expenditure was comparable with the present one. The depreciation reserve has made possible the replacement of obsolete with new equipment, in recent years, with consequent economy in operation and improvement in service.

The Capital Data

On page 89 is given a comprehensive picture of the present and previous capital structures of the Railway, back to 1900. It will be noted that in 1900 the stock issues represented about 59 per cent of the total property, whereas today they represent 32.6 per cent. Of the total investment in 1900 about 30 per cent was funded, that is, was represented by railway bonds, while the City of Boston had furnished 11 per cent of the money. The above table gives interesting comparative percentages:

During the period from 1900 to 1926 the gross transit debt increased 269 per cent, from $43,101,000 to $159,081,505. In other words the investment in the property is that much greater. The funded debt increased in about the same ratio, namely 287 per cent, from $12,866,000 to $49,819,000. The investment by the stockholders a little more than doubled, i.e., it increased 103½ per cent, from $25,485,000 to $51,870,805, whereas the City of Boston has increased its investment by 881 per cent, from $4,750,000 to $46,591,700. The State of Massachusetts did not become interested financially in the property until the trustees assumed charge, when it purchased the Cambridge subway for a little under $8,000,000.

STREET CARS FOR SAFETY

There are street car accidents—more than we like to see—but it still is a fact that electric railway travel is the safest in the world. Proof of this is given in an article recently published in the *Scientific American.*

On electric railways only one fatality occurs to every 8,422,460 persons carried.

On steam railways fatalities are one out of every 6,313,800.

Coastwise, lake, and river steamships lose one passenger out of every 5,973,436.

No one really knows the proportion of fatalities to passengers carried by buses, taxicabs, jitneys and private automobiles.

Benjamin Franklin gave this advice to readers: "I would advise you to read with a pen in your hand, and enter in a little book short hints of what you find that is curious, or that may be useful; for this will be the best method of imprinting such particulars in your memory. I think it would be well for you to have a good dictionary at hand, to consult immediately when you meet a word that you do not comprehend the precise meaning of."

The fellow who is pulling on the cars hasn't time to rock the boat.—*Commonwealther.*

ELEVATED CLOSE-UPS

The R. T. L. Car-House Repairmen

THE rapid-transit lines division of the rolling-stock and shops department has four inspection shops, located at Sullivan Square, Forest Hills, Eliot Square, Cambridge, and Maverick Square, East Boston. These shops, with a total of 102 car-house repairmen, handle a total of 466 passenger cars, namely 323 main-line cars, 95 Cambridge Subway-Dorchester Tunnel cars and 48 East Boston Tunnel cars. In addition to the passenger cars there are also a number of work cars, flat cars, electric locomotives, etc.

Cars on the main line, operating between Sullivan Square and Forest Hills shop, are inspected on what is termed as a mileage basis. A record is kept of the miles each car runs, and when a total of about 850 miles is reached the car is brought to the shop for inspection. Twenty cars are inspected daily at each shop, Sullivan Square and Forest Hills, or a total of forty cars per day.

This same method is used at the Eliot Square shop for the Cambridge Subway-Dorchester Tunnel cars, but in the East Boston Tunnnel where only 48 cars are operated, they are brought to the shop for inspection on a time basis, that is, four cars per day are given a general inspection and are brought into the shop in rotation. This makes the time between inspections about two weeks, but as the average miles run per day is relatively low on these cars, this method works out very well.

A certain group of men in the repairmen's class are known as inspectors. These men have specified parts of the inspection of cars which they look over and for which they are held accountable. For instance, one man is known as the air-brake inspector, and it is his duty to inspect the different parts of the air-brake equipment, such as governors, motorman's valves, feed valves, whistles, hose, etc. Another inspector looks over the car body, another the brake shoes, beams and trucks, and still another the control, etc. In this way each car brought to the shop for the day inspection is thoroughly looked over. Also the main line and Cambridge Subway cars are inspected each night, which is chiefly a safety measure, the trucks and brake rigging being looked over for anything missing, broken or worn out.

If the inspector finds some little defect that he can remedy himself without interfering too much with his inspection, he does so, but if he finds something that is liable to require too much time to repair and which would hinder him from completing his inspection of all the cars brought in for the day, he reports the defect to the foreman, who puts another man on the job. This other man may be a carpenter, a wireman or a steamfitter, according to the nature of the defect found; or he may be another repairman who is kept for just such cases. This repairman does not do any inspection, but is kept busy making repairs, overhauling various parts, etc. He may also be used to look up and put in working order such cars as may be ordered off the road for defects. In order to distinguish these men from the other repairmen they are termed floor men or general-utility men. It is necessary that these men have a general knowledge of all the working parts of a car, as when one is taken out of service for a defect, whether it be for control trouble, dead car, hot journal box, brake trouble, etc., the trouble must be remedied as soon as possible and the car put back into service in order to keep up the schedule.

Besides the inspectors and the general-utility men, there are other repairmen whose duty it is to remove the shoe beams, disconnect the brake rigging, etc., and prepare truck to be sent to the machine shop for change of wheels, motors, etc. When the truck returns from the machine shop and is again put under car, these men re-assemble the shoe beams, connect up the brake rigging, and see that trucks are "O.K." before the car is put into service.

In other words, the duties of the car-house repairmen on the whole are to keep the cars in as nearly perfect an operating condition as possible, in order that the schedule may be maintained and the public carried with a maximum of safety, and this only can be accomplished by a systematic inspection and an accurate knowledge of the equipment.

EDUCATION COMMITTEE

The educational activities of the Railway for the coming year will be in charge of the following committee recently appointed by the general manager in co-operation with department heads:

Edwin M. Brooks................Legal
Francis W. Casey..............Claims
James Donohue..................Power
Joseph D. Donovan........Auditing
Wilmot M. Evans......Purchasing
Joseph A. Griffin Transportation
Rudolph Kundert........R. S. & S.
E. R. Peters..................Treasury
A. G. Reynolds........Maintenance

HOW THE STOCK EXCHANGE SERVES THE PUBLIC*

Financial Expert Traces Development of This Great Institution and Explains Current Terms Not Always Clearly Understood. Wall Street Not a "Glorified Monte Carlo."

HUGH BANCROFT, publisher of the Boston News Bureau, the Wall Street Journal and Barron's Weekly, the speaker on stock exchanges and their service to the public before a group of "El" employees, has been closely identified with financial publishing for many years. In introducing his subject he urged owners of insurance policies, stock certificates, bonds, etc., to keep their securities in a safe place. The best place is a safe-deposit box such as are rented at low rates by banks or trust companies. Stock certificates and registered bonds, if lost, are useless to a finder, but expense and difficulty are involved in having them duplicated. An unregistered bond can be cashed by an unscrupulous finder.

In regard to stock exchanges Mr. Bancroft said that they came into existence to satisfy the demand for a market place where securities could be bought and sold. They are not "glorified Monte Carlos" for the accommodation of gamblers who desire to fleece the public. In fact the New York exchange was the result of the issuing of bonds by our government soon after it came into existence, and the people wanted a place for trade in government bonds.

The stock exchange permits securities to be sold or bought quickly as contrasted with selling by means of auctions, as is done to a limited extent. Business today is done by getting money together for the use of corporations in comparatively small sums from a large number of investors. This requires facilities for selling securities readily on a basis of the confidence of the investor in the investment. Such facilities are provided by the stock exchange, which is so organized that usually a security listed with it can be sold in a few minutes. This is true whether the transaction involves one share or 10,000 shares.

Lots of a hundred shares are standard in buying or selling on the exchange. Smaller orders are handled through odd-lot brokers who specialize in this business. They sell at an eighth of a point per share higher than the market for 100-share lots and buy at the same margin lower. They then combine smaller purchases or sales into 100-share lots. This is a great and inexpensive convenience for the small investor.

A great deal is heard about speculation on the stock exchanges. It is true that at least 80 per cent of the transactions are by persons who do not own the securities when they sell them or do not intend to keep securities when they buy them. When this is done by experienced operators it is legitimate. It has nothing in common with the stupid gambling of people who know nothing about the value of securities and who think they have found an easy road to wealth. The fellow who bets on a race horse because he likes its color is no more foolish. Speculation of the right kind is necessary to the maintenance of a market because the speculators temporarily take up surplus securities that are for sale and supply extra demands, usually at a small margin in either case.

The real speculator sells securities that he does not own in the same way that the manufacturer sells goods that he has not yet made, and perhaps has not the materials and labor to make. In either case the sale is made with the knowledge that deliveries can be made with practical assurance when promised. On the other hand the speculator buys for early sale securities which he might not wish to keep permanently just as a merchant buys goods which he expects to sell again at a reasonable profit.

These speculative traders buy and sell largely to one another, and their transactions in the aggregate far exceed those of investors. This makes a broad market, however, which enables the investors of the country to buy and sell closely and thus enables the large business enterprises to secure the money upon which our present industrial organization is based.

MR. BANCROFT'S ANSWERS TO QUESTIONS

Following the address, the speaker gave much supplementary information in answer to questions:

Q. Why are some common stocks now sold without par value?

A. Par value is usually a fictitious thing, not being based on cash actually paid in. The idea naturally created in a person's mind is if the par value is $100 the stock is in some way worth $100. In fact, it is worth only what it will bring in the market. Now it is recognized that a share of stock in a company represents simply one share in the company. If the company has five thousand shares of stock, the owner of one share has an undivided interest of 1/5000th of whatever the company has, whatever it may be worth. Stock without par value gives no fictitious idea of its worth.

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*Ninth in a series of talks on investing savings, L. J. Dickey, chairman.

Q. What gives such great value to membership in a stock exchange?

A. The limitation of membership. For example there are only twelve hundred members in the New York Exchange, which is simply a voluntary association. Any other group of men can organize an exchange if they wish to but membership in the New York Exchange is valuable because it has become a natural market place for the securities of all the large companies of the country. The initiation fee and dues are comparatively small, but "seats" today are selling at about $135,000.*

Q. Then a member may make a profit out of selling his "seat"?

A. Yes. A member who joined in the early 70's when his "seat" cost $2000 or $3000 recently sold it at $150,000. But a man might sell at a loss.

Q. Is much buying and selling of securities done outside of the exchanges?

A. A large business is done outside the exchange, in unlisted stocks and bonds, even by members of the exchange. Listed securities must be dealt in on the exchange, but the business, especially in bonds, outside the exchange, is large. This is particularly true with relatively small issues. The market is much better on the exchange. Sales of unlisted securities are expensive because the services of a salesman are required. Again an investor is safer in buying a listed security because otherwise he depends entirely on the reputation of the broker. Listed securities also usually sell higher than unlisted securities of equal merit because they are easier to sell.

Q. What is meant by "bulls" and "bears" on the market?

A. This refers to the speculative side of the market. If a dealer is manipulating securities so as to force down prices to make money by so doing, this is called a "bear" operation. If he does the same thing so as to force prices up he is called a "bull" operator. In other words a "bear" is a man who is expecting a price to go down with profit to himself, while a "bull" is a man who expects them to go up. There may be "bullish" or "bearish" operations where traders are buying or selling simply because they think events warrant one course or the other at a profit. As people do not all think alike some traders may be buying while others are selling the same securities.

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*In June, 1927, a seat sold for the record price of $220,000.

"Why are we so late?" asked the passenger of the conductor.

"Well, sir," explained the conductor, "the train in front was behind, and this train was behind before, besides."—*Exchange.*

STRAPHANGERS

During May the Boston Daily Advertiser published two editorials which criticized the crowding in the Washington Street Tunnel. To the first editorial Mr. Dana replied in some detail in order to give the editor the facts. The second editorial quoted parts of Mr. Dana's letter reiterating the contention regarding inandequacy of service. The editorials and Mr. Dana's letter are given below in order that all employees may understand the attitude of the Railway in this matter.

Editorial of May 11

General Manager Edward Dana of the Boston Elevated Railroad has been investigating conditions in the evening "rush" hour, and what do you suppose he has found?

You would never guess.

There are plenty of seats!

Some of us may THINK we have been standing up, night after night, all the way home, but THAT'S imagination.

The check was made on the South Huntington avenue line, at the junction of Massachusetts and Huntington avenues, between 5 and 6 o'clock.

Ten cars were counted, nine of them carrying trailers.

The first car had 52 seats and only 45 passengers, with NO straphangers.

In the next car there were 62 seats and only 30 passengers.

The total count showed 1078 seats, and 1095 passengers. In the one hour period, in short, there were seats enough to accommodate all but 17 passengers.

Many get off at Mass. avenue.

OUR guess would be that the explanation may be found in rush-hour conditions at Park street, where the crowds are so big and congestion is so great, that for an hour or more cars must be hurried out, whether they are loaded or only partly loaded.

On the other hand, take conditions in the Washington street TUNNEL at Winter street.

We looked in there yesterday, NOT at the rush hour, but at 1 o'clock in the afternoon.

At 1.04 o'clock a train for Forest Hills came along. It was made up of four cars, numbered 0211, 2226, 0118 and 0351.

Arriving or departing, there was not a vacant seat in ANY of these cars. WOMEN were standing in ALL of them.

Anyone who expects ALWAYS to find a seat in his trolley car at the rush hour is most unreasonable.

But there is nothing at all unreasonable, or so it seems to this newspaper, in asking for a seat for every tunnel-train passenger IN THE MIDDLE OF THE DAY.

When Mr. Dana's checkers and counters go abroad again we hope they will consider the TUNNEL, morning, noon, or night.

Mr. Dana's Reply

To the Editor, BOSTON ADVERTISER.
Dear Sir:

I noted your editorial of May 11, 1927, and its apparent inquiry as to the Washington Street Tunnel service.

Obviously rapid transit train service is subject to a different set of factors than the surface line operation with which you drew a comparison.

On the very day of your editorial we detailed men to ride a morning and an afternoon non-rush hour round trip between Forest Hills and Everett, and return. I submit a chart of this information, which is illuminating upon the subject of the main line elevated service.

Four-car trains are operated the entire length of the main line from Forest Hills to Everett, every 3-1/2 minutes, providing 180 seats for the entire trip in each direction.

As the count of passengers on these trips indicates, a single car would have been adequate to carry the traffic at the outermost terminals, yet four cars were provided and run the entire distance in order that the additional traffic might be handled in the middle area of the line.

Taking the journey as a whole, the number of empty seats provided over the entire line greatly exceed the few persons required to stand over a portion of the line.

The cost of service is affected by the total seat-miles operated, and if the service was reduced to just the number of seats required at the less traveled sections of the line and these seats applied to the short sections where standing passengers are found, one evil might have been overcome but another evil would have been created because the infrquency of service which would thus exist at the terminals would result in poor connections between surface cars and longer waits for trains.

The question resolves itself, therefore, into an attempt to meet the varying conditions of load throughout the entire line and still adequately serve the maximum load point, which is at Washington and Summer Streets.

During the non-rush hours between 9 A. M. and 5 P. M. the following facts obtain with regard to seats provided and passengers carried in and out of the so-called "delivery district" where the maximum load point is found, both northbound and southbound:

From the South

	Seats	Passengers
Inbound	34,680	32,419
Outbound	34,970	29,375
Total	69,650	61,794

From the North

	Seats	Passengers
Inbound	29,159	27,901
Outbound	27,764	25,292
Total	56,923	53,193

Drawbridge openings which distort the frequency or irregular connecting loads at various interchange points, are conducive to irregular loading so that conditions arise where passengers prefer to stand for short distances rather than wait even on a 2-½ minute frequency.

Such conditions are not unlike the fluctuating passage of automobiles at intersections. Often considerable congestion exists in the passage of vehicles at one moment and comparative freedom a few minutes later.

Upon steam railroads where long headways occur and passengers wait in the terminal station, the stability of traffic is easier to determine and necessary capacity provided.

The rapidity of collection and great volume of traffic on rapid transit lines or surface car lines does not lend itself to such assurance of load for each and every train, and as the connecting service is perishable in that it is lost if not used, the problem is a different one.

Every effort is constantly being made to render maximum service at minimum total cost, and I trust the above information may be of interest to you in connection with your editorial.

Editorial of May 17

The Daily Advertiser acknowledges receipt of a communication from Mr. Edward Dana, General Manager of the Boston Elevated Railway, on the subject of an editorial which was printed in these columns on Wednesday last, on the subject of TUNNEL "straphangers" in non-rush hours.

The editorial cited as typical of non-rush hour conditions in the Tunnel the number of standees in all the cars of a 1 p. m. train.

Mr. Dana does not dispute the facts as set forth in the editorial, which as a matter of fact, censured the fault-finder who believes he should invariably have a whole seat in rush hours, but he explains that:

"Obviously RAPID TRANSIT train service is subject to a different set of factors than the surface line operation with which you drew a comparison."

The General Manager of the Elevated sends a chart with his letter showing how a late forenoon Tunnel train starts in-town from Forest Hills with 14 passengers, picks up three more at Green street, five at Egleston Square and is without a real load until it reaches Dudley street. At Essex, Summer and State stations it begins to thin out again.

Mr. Dana explains:

"As the count of passengers on these trips indicates, a single car would have been adequate to carry the traffic at the outermost terminals, yet four cars were provided and run the entire distance in order that the additional traffic might be handled in the middle area of the line.

"Taking the journey as a whole, the number of empty seats provided over the ENTIRE line greatly exceeds the few persons required to stand over a PORTION of the line. * * * The question resolves itself, therefore, into an attempt to meet the varying conditions of load throughout the entire line and still adequately serve the maximum load point, which is at Washington and Summer streets."

The Daily Advertiser is glad to have heard from General Manager Dana and thanks him for his courtesy. His letter appears to confirm what our editorial said and it offers no hope. In our opinion, the passenger who pays his 10 cents in the middle area of the line—and please observe that we speak only of non-rush hours—is just as much entitled to a seat as the passenger who comes on at one of the terminal stations.

And questions are:

1.—Why doesn't he get it?

2.—Is he ever going to get it?"

3.—Will there ever be authority enough anywhere, city or State, to see that he DOES get it?—Ed. Daily Advertiser.

ANSWERS TO HEALTH QUESTIONS

(See page 85 for questions)

1. No.
2. No.
3. Once a day.
4. No. Overweight is dangerous to health.
5. By being thoroughly examined by a competent physician.
6. Eight hours.
7. No.
8. Milk.
9. Every 6 months.
10. Once a year.
11. Consult a physician and avoid taking "headache cures."
12. Diseases can be cured most easily when they are just beginning. The longer a disease runs the more difficult it is to cure.
13. Dark bread.
14. Six to eight glasses.
15. Small pox, diphtheria, typhoid fever and sometimes, scarlet fever.

What Do You Know About the "El"?

THE following questions supplement those printed last month. The answers to last month's questions appear below.

NEW QUESTIONS

46. How much energy in kilowatt-hours was produced in the "El" power plants in 1926?
47. How does the "El" rank as an electric power producer?
48. What is the purpose of the automatic control recently installed in the power plant at Everett?
49. How many men have been in the "El" service over fifty years?
50. By how much was the reserve fund under $1,000,000 on May 1?
51. How much greater was the percentage of gross revenue spent for maintenance in 1926 than the percentage for 1916?
52. In which recent month was the average number of weekday passengers on the "El" the greatest in the history of the Railway?
53. Who are respectively the superintendents of the R. T. L., Div. 1, Div. 2, Div. 3 and Div. 4?
54. Approximately what is the Railway's monthly bus-mileage?
55. How much fuel is used per year in the "El" shops to supply the oil furnaces, the forges and the case-hardening furnace?

ANSWERS TO LAST MONTH'S QUESTIONS

36. For what purpose is the Railway using the new steel cars which are now being delivered?
    Ans. To replace wooden cars on the elevated line.
37. What was the difference between the largest and smallest numbers of revenue passengers carried per month in 1926?
    Ans. 9,093,789, i. e., 35,474,895 (Dec.) minus 26,381,206 (Aug.).
38. How many miles of trolley wire are required in the furnishing of service by the "El"?
    Ans. Four hundred fifty-four.
39. What were the sources of the $37,000,000 expended by the Railway on plant improvements during the period of public control?
    Ans. Preferred stock, $2,000,000; sale of Cambridge subway, $7,868,000; depreciation charge, $18,856,000; fire insurance, $1,000,000; sale of real estate, $1,850,000; bonds, $4,926,000; premiums on bonds, $51,000.
40. What prompted the school children to submit the safety compositions printed in recent issues of "Co-operation"?
    Ans. An offer, made by the general manager over the radio to the Big Brother Club, of twenty $5 gold pieces for the best twenty poems on being careful and preventing accidents on the highway.
41. How many snow loaders are operated during snow storms by the maintenance department?
    Ans. Nine.
42. What percentage of daily commuter traffic in and out of Boston is carried by the "El"?
    Ans. 62.9 per cent July 1, 1926.
43. What is the significance of the slogan, "A Ride a Day Keeps Poor Service Away"?
    Ans. If every person in the territory serviced by the "El" would, on the average, ride once daily the added revenue would permit the service to be materially improved.
44. What was the average number of revenue passengers carried per week day during 1926?
    Ans. 1,086,544.
45. What was the cost of accidents during 1926 in cents per car-mile?
    Ans. 1.66 cents, for fiscal year ending June 30.

CHANGES IN THE RESERVE FUND

Fiscal Year 1925-26

July 1, 1925, $1,000,000

July	$249,477.93*	Jan.	$223,30190†
Aug.	367,593.94*	Feb.	185,989.63*
Sept.	176,763.97*	Mar.	161,772.65†
Oct.	117,703.96†	April	77,031.69†
Nov.	45,265.00†	May	57,010.06†
Dec.	289,347.71†	June	1,662.18*

Profit and loss credit....$32,359.07

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†Excess of revenue over cost of service.

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	$393,028.41*	Jan.	$186,947.50†
Aug.	451,546.79*	Feb.	92,018.37†
Sept.	236,543.80*	Mar.	256,586.83†
Oct.	2,723.19†	April	181,694 29†
Nov.	29,302.22†	May	113,284.72†
Dec.	234,879.91†		

Profit and loss debit..........$24,445.59

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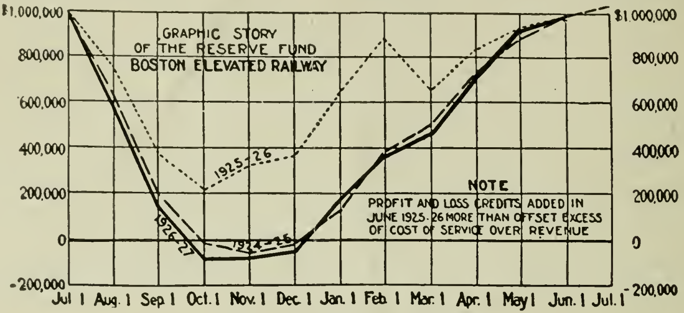
*Excess of cost of service over revenue



MAY OPERATION

GENERAL FINANCIAL DATA	1927	1926
Revenue exceeded cost of service	$113,284.72	$57,010.16
Operating revenue per car-hour (A.E.R.A. std.)	$6.04	$5.81
Operating revenue per car-mile operated	60.75c	59.94c
Average fare per revenue passenger	9.236c	9.256c
Ratio operating expense to operating revenue	69.05%	70.89%
PASSENGERS CARRIED		
Revenue passengers	31,310,257	31,576,293
Per cent 5c and 6c passengers	18.52%	18.05%
Revenue passengers per car-mile operated	6.341	6.295
OPERATING FACTS		
Trips operated	633,686	654,538
Car-miles operated:		
Rapid-transit lines	1,302,110	1,290,696
Surface, two-man	1,855,118	2,096,235
Surface, one-man	1,298,297	1,224,525
Express, newspaper and sprinkler cars	814	7,458
Motor bus	481,812	404,463
Total miles operated	4,938,151	5,023,377
ACCIDENT DATA		
Accidents per 10,000 car-miles	1.84*	2.18*
Accidents per 10,000 bus-miles	2.59*	2.87*
Revenue passengers carried per reported accident	18,450	17,020
Average number of witnesses per accident	3.66	3.24
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	11	8
Employees complained of by car riders	111	78
Car defects reported per 10,000 car-miles	3.4	3.9
INFORMATION ABOUT POWER		
D.c. kw.-hr. output gross per month	17,738,420	18,101,785
Maximum kw. load	63,060	61,190
Tons of coal consumed for power	15,384	15,308
Lbs. of coal for power per d.c. kw.-hr. at cars	1.948	1.894
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	1.013c	1.056c
Per revenue car-mile	3.69c	3.79c
Kw.-hr. per revenue car-mile	3.644	3.586

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*This does not include miscellaneous accidents or derailments.

June 25, 1927. EDWARD DANA, *General Manager,*

Volume 6 JULY, 1927 Number 7

Boston Elevated Close-Ups

THE BOILER-ROOM FIREMAN

(See Page 106)

To All 'El' Employees

Summer is the season of light riding on the Railway. In 1926 there were 37.4 per cent more passengers on the average week-day in December than there were in August.

And yet the service is not, and cannot be reduced in summer in proportion to the shrinkage in traffic. Hence the service ought to be more attractive in summer.

The public would find economy in using their automobiles largely outside of our territory and using our service within it, to say nothing of eliminating parking worries.

Every member of the "El" family can help to stimulate riding in light periods—

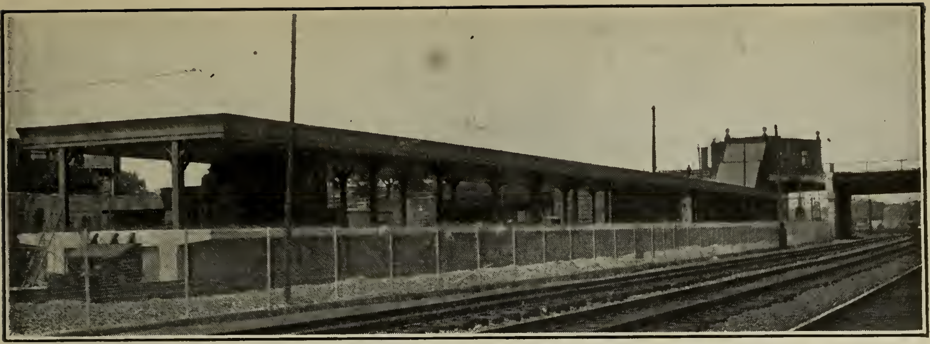
by extreme courtesy—

by close attention to details—

by real salesmanship.

Edward Dana

"A Ride a Day Keeps Poor Service Away"



COLUMBIA STATION FROM OLD COLONY RAILROAD

FIRST STATION ON RAPID-TRANSIT EXTENSION

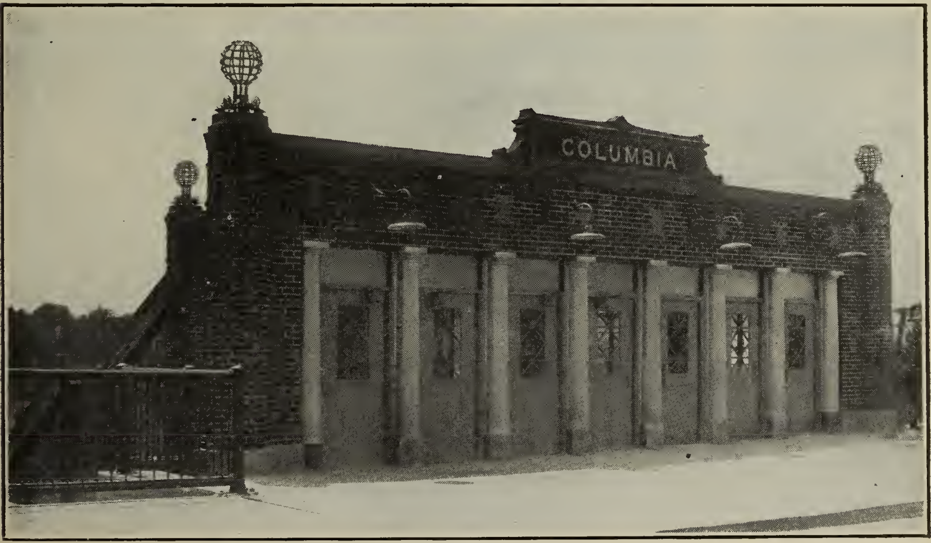
This Station Is of the "Island" Type and Substantially Constructed of Steel, Concrete and Brick—The Headhouse Contains the Fare-Collection Facilities and Is Located on Columbia Road

As will be evident from the accompanying illustrations, the Columbia station of the Dorchester rapid-transit extension is arranged simply and yet it is entirely adequate for the service which will be required of it. This station is now practically complete.

The entrance building fronts on Columbia Road Boulevard, the headhouse being provided with ample doorways with doors swinging in and out. These doorways lead into an area approximately 290 sq. ft. located on the sidewalk level.

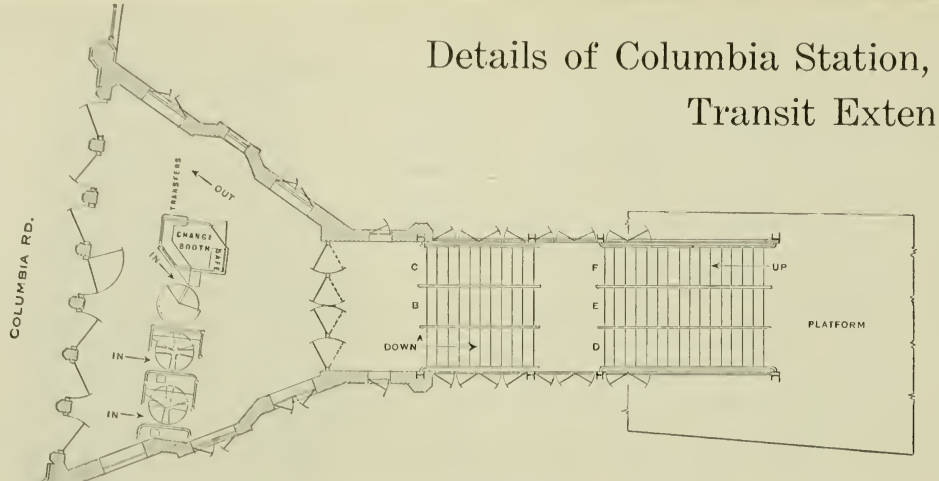
In this area is located the apparatus for collecting fares, making change, etc. This includes two General Electric automatic dime-in-the-slot passimeters, for the quick and convenient collection of fares.

A change booth is provided so that persons not having dimes may readily have change made and may pass, if they so desire, through the old-type passimeter located at the change booth window.

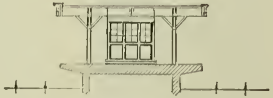


FACADE OF HEADHOUSE ON COLUMBIA ROAD

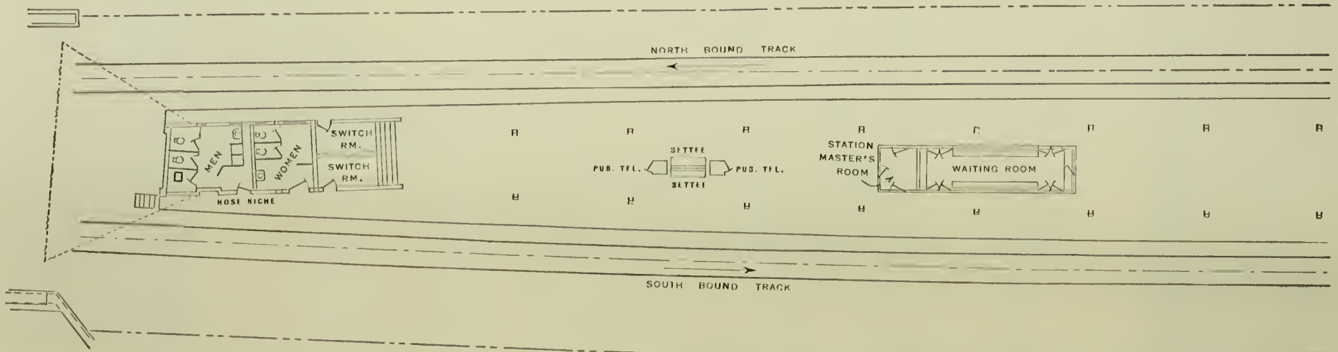
Details of Columbia Station, Dorchester Rapid-Transit Extension



PLAN OF HEAD HOUSE



SECTION THRO' STATION LOOKING NORTH



Beyond the fare-collection barrier, access to the station platform is provided by two flights of stairs leading to the north end of the platform below. At the point where the stairs reach it, the platform is 20 feet wide. It extends from this point south for a distance of 350 feet, where the width is 23 feet.

PLATFORM DETAILS

The platform is located between the tracks and is constructed of concrete on concrete foundations. It overhangs the foundations approximately 4 feet, leaving a space between the edge of the platform and the foundations for cables, wires, piping and other necessary equipment. The space will also serve as a refuge for workmen on the track when a train is approaching.

Each edge of the platform is provided with a white strip of concrete 6 inches in width to indicate graphically the edge of the platform.

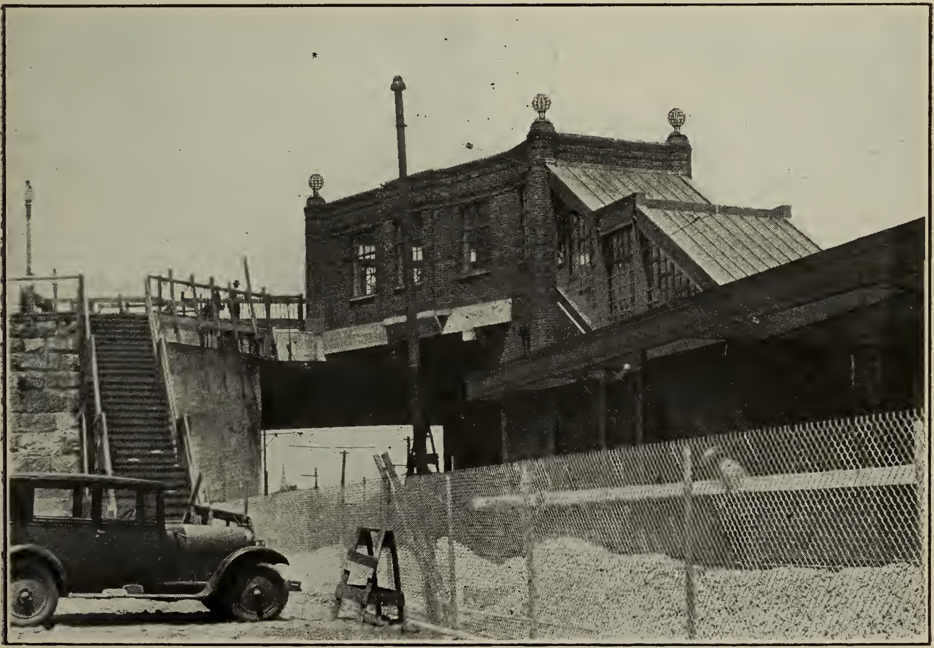
The platform is covered for its entire length with a canopy which projects practically to the edge of the platform and is slightly higher than the roofs of the cars. This canopy is supported by steel members and the roof is made of concrete, slab-waterproofed in the usual manner, with suitable water conductors for drainage.

The tracks were so located as to provide for extension southwardly for a distance of 135 feet. Such an extension will be made when 6-car trains are to be operated.

Under the entrance stairways are the toilets for the public and employees, together with rooms for switch closets, and in the center of the platform are a waiting room, with seats, and the station master's room.

At suitable intervals on the platform four public telephones will be installed, and there will also be six concrete settees on the platform. There will be no dividing fence on the platform.

Advertising signs will be displayed on the right-of-way fence opposite the platform.



HEADHOUSE AND STAIRWAY FROM CARSON STREET

Columbia Station is an "island station," located between the two main-line tracks. Taking into consideration that it is an out-of-door station it approximates as nearly as possible the best type of subway or underground stations. It is constructed substantially and is entirely fireproof.

For the convenience of persons desiring access to the station from Dorchester Avenue there has been provided a stairway leading from the foot of Carson Street to the street level. Patrons can thus reach the station directly and thereby avoid going out of their way to reach Columbia Road and the bridge over the railroad tracks.

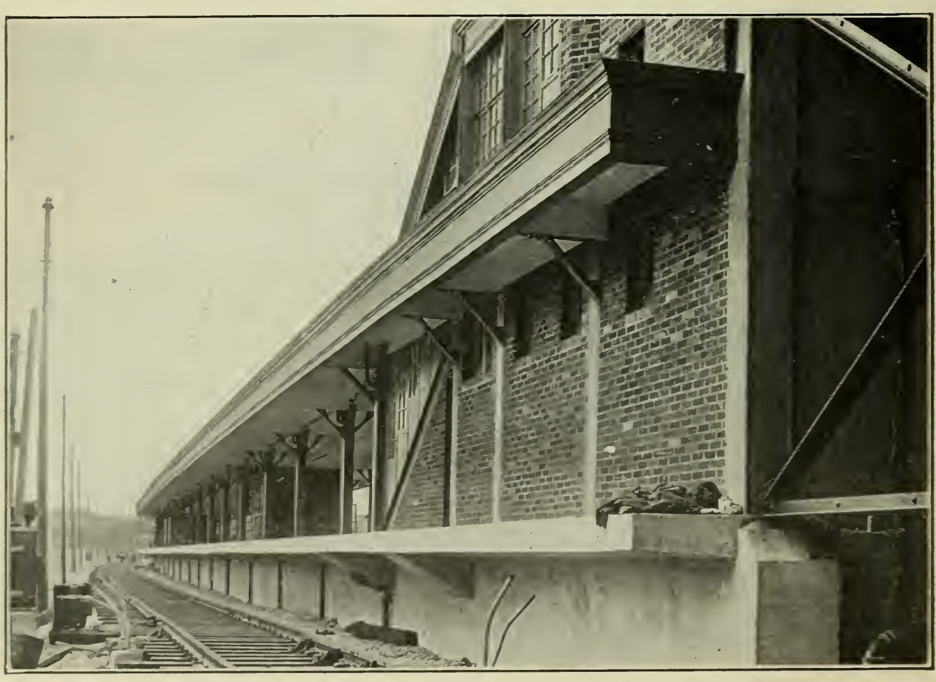
Columbia station will not only serve the people located in the vicinity of Columbia Road and Dorchester Avenue but also people making use of the Strandway beach located on the shore of Dorchester Bay.

It will also serve employees in the industrial plants in the immediate neighborhood, which are as follows:

Boston Consolidated Gas Co.
Pumping Station (Sewer).
Harry Butter & Co., Smelters and Refiners.
Whittemore Oil & Chemical Co.
Tidewater Oil Co.
National Can Co.
Block Jones Photo Co.
American Metallurgical Corp.
Underwood Machinery Co.
Arco Reduction Sales Co.
Meisel Press Mfg. Co.
The Ernest M. Skinner Co. Organ Factory.

APOTHEOSIS OF WORK

I am the foundation of all business. I am the fount of all prosperity. I am the parent of genius. I am the salt that gives life its savor. I can do more to advance a youth than his own parents, be they ever so rich. Fools hate me; wise men love me. I am represented in every loaf of bread that comes from the oven, in every train that crosses the continent, in every newspaper that comes from the press. I am the mother of democracy. All progress springs from me. Who and what am I? I am WORK.—*Exchange.*



COLUMBIA STATION FROM NORTHBOUND TRACK

GUARDIANS OF DESTINY

About in the center of the car sits an elderly, well-dressed man, with a traveling bag under the seat. His car broke down, his phone was out of order, so he is using the street car to hurry to the train that will take him to a directors' meeting in a far distant city. Thousands of dollars will be involved in the outcome of that meeting.

A visiting nurse sitting in the third seat front is on her way to a maternity case.

A boy right behind you is bringing a warm dinner to his dad working in the construction gang at the end of the route.

An attorney is on his way to the court house to close an important deal.

A young lady is on her way to the train to meet her crippled aunt arriving on the noon train.

A young man has a very important appointment with his friend at a certain street corner.

Every passenger in your car has some place very important to get to. For some it is very vital that they arrive there on time. Will you see to it that they do? Will you see to it that they arrive there safely? Will you see to it that they arrive on time and allow no accident to cause delay?

You are the guardian of their destiny as long as they are on your car. Will you be true to your trust?—*Exchange.*

Men and companies, like watches, are known by their works.—*Commonwealther.*

"EL" BUSES TRANSPORT SOLDIERS

On Saturday, July 9, under perfect weather conditions, the Railway buses carried nearly 1500 men to Camp Devens for their summer encampment. Fifty-nine buses, each containing approximately twenty-five men, with their equipment, were mobilized in four groups for this purpose. Group 1 (12 buses) started from Medford Square, Group 2 (22 buses) from Cambridge, Somerville and Charlestown armories, Group 3 (16 buses) from East Newton Street armory, and Group 4 (9 buses) comprising six buses from South Station with troops from Attleboro, which were joined by three more at Irvington Street armory. Each group was accompanied by a repair truck as insurance against emergency.

Two State Constabulary officers on motorcycles went with each group, one leading and setting the pace at about 20 miles per hour, the other guarding the rear from interference.

The "El" furnished nearly one-half of all the buses engaged in this troop movement, the total involved being about 125.

DON'T QUIT

When things go wrong, as they sometimes will,
When the road you're trudging seems all uphill,
When the funds are low and the debts are high,
And you want to smile, but you have to sigh,
When care is pressing you down a bit,
Rest, if you must—but never quit.

Success is failure turned inside out,
The silver tints of the clouds of doubt,
And you never can feel how close you are;
It may be near when it seems afar,
So stick to the fight when you're hardest hit,
It's when things seem worst that you mustn't quit!

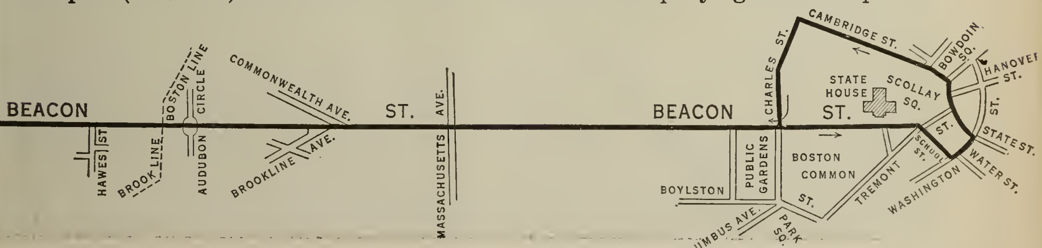
—*The Review.*

THE DE LUXE BUS ROUTE

Service on the de luxe bus route on Beacon Street, as described in the issue of "Co-operation" for February, 1927, page 25, was inaugurated on May 16, and has been operated continuously since that date. The largest day's business so far has been sixty-six passengers. The patrons are principally business men and shoppers, and many favorable comments on the service have been received.

Originally the schedule called for four stops each way, but this was modified later to "stop on signal." The bus has run close to schedule on all trips.

Prior to the starting of service a folder was prepared and distributed in Boston and Brookline. A feature of this was the accompanying route map.



THE DE LUXE BUS ROUTE

$159,000,000. at your service for ten cents

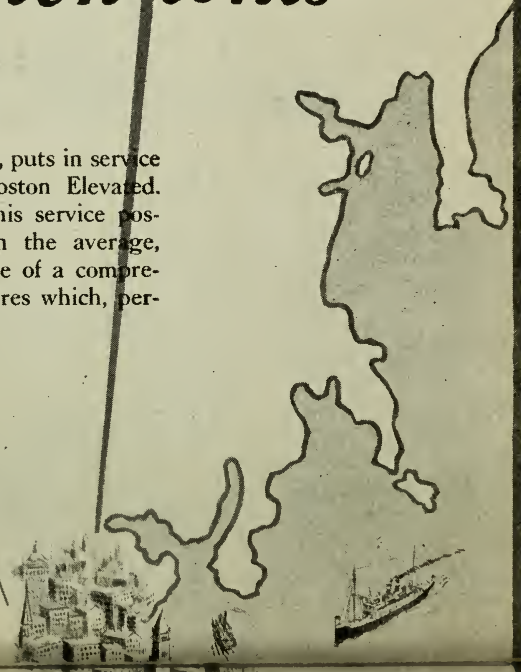
*F*OR *your safety and the safety of others, the Boston Elevated employs, as operating personnel, carefully chosen and carefully trained men upon whom responsibility for your safety rests while you are riding.*

*A*FTER *you have used an Elevated car, train or bus, you simply get off and leave it. You are relieved of the worry and maintenance expenses of the automobile and are not concerned with how, where and when Elevated vehicles are cared for while you are not using them.*

*F*OR *your safety, the entire Elevated system is well equipped with the most modern signal and safety devices, maintained with incessant and scrupulous care. No other travel system in the city protects the lives of passengers so carefully as the Boston Elevated. In reality, the Boston Elevated takes better care of your life and limb than you ordinarily do yourself.*

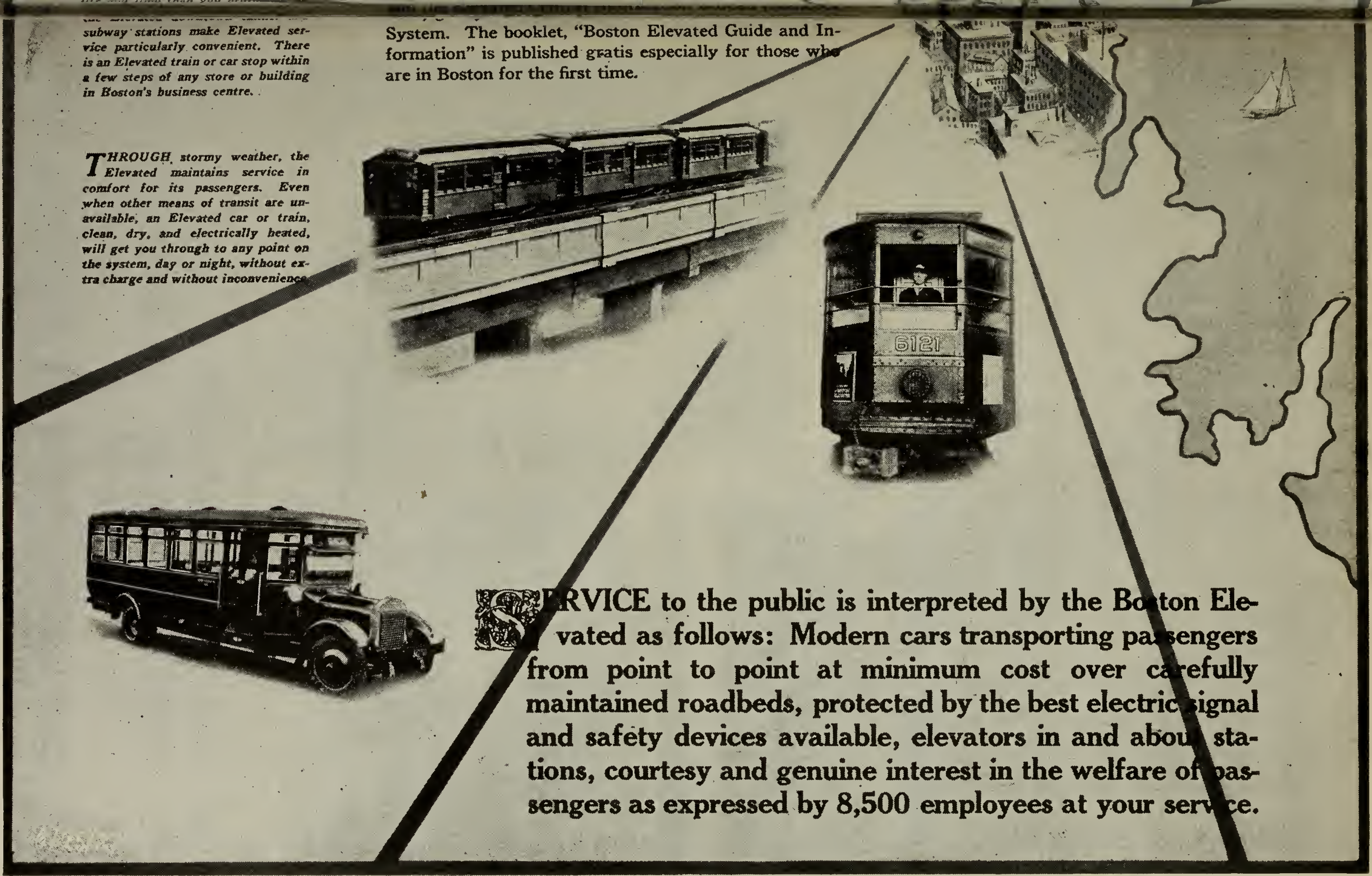
YOUR individual dime dropped in the fare box, puts in service for you the $159,000,000 system of the Boston Elevated. Alone of course, your one fare would not make this service possible, but with more than one million others on the average, using the Elevated daily, you have the advantage of a comprehensive transportation service having many features which, perhaps, you do not ordinarily realize.

YOU ARE as close to any desired point in Boston, day or night, as the nearest train, bus, or car stop. One service or another on the great network of Elevated lines will take you within a few steps of practically any spot in the territory in which the Elevated operates. At its cost, this service cannot be given by any other transportation system.



subway stations make Elevated service particularly convenient. There

System The booklet, "Boston Elevated Guide and Information" is published gratis especially for those who



subway stations make Elevated service particularly convenient. There is an Elevated train or car stop within a few steps of any store or building in Boston's business centre.

System. The booklet, "Boston Elevated Guide and Information" is published gratis especially for those who are in Boston for the first time.

THROUGH stormy weather, the Elevated maintains service in comfort for its passengers. Even when other means of transit are unavailable, an Elevated car or train, clean, dry, and electrically heated, will get you through to any point on the system, day or night, without extra charge and without inconvenience.

SERVICE to the public is interpreted by the Boston Elevated as follows: Modern cars transporting passengers from point to point at minimum cost over carefully maintained roadbeds, protected by the best electric signal and safety devices available, elevators in and about stations, courtesy and genuine interest in the welfare of passengers as expressed by 8,500 employees at your service.

A FULL-PAGE NEWSPAPER ADVERTISEMENT DESIGNED TO STIMULATE SUMMER RIDING

ELEVATED CLOSE-UPS

The Boiler-Room Fireman

(See Illustration on Front Cover)

On the front cover of this issue appears a fireman observing the condition of the fire in one of the 600-horsepower boilers at our South Boston Power Station.

At this station there are twenty boilers of this rating, two of 1825-horsepower rating and two, now being installed, of 2075-horsepower rating. When the present installations are in regular operation, the rated boiler capacity of this station will be 19,800-horsepower, capable of developing sufficient steam to produce 95,000 kilowatts, alternating current, at the generators.

Nineteen of the 600-horsepower and both of the 1825-horsepower boilers are equipped with automatic stokers. One of the 600-horsepower, and the two new 2075-horsepower boilers burn pulverized coal.

Coal is delivered to the hoppers of the individual boilers by a traveling larry and the feed to the stokers, or pulverized fuel-burning equipment, as the case may be, is automatic.

In a modern power plant many means of indicating operating conditions in the boiler-room are provided. Steam-flow meters record the rate of steam flow, air-flow and temperature of uptake gases. Multi-point gauges indicate furnace and uptake drafts, air pressures and feed water temperature. Carbon dioxide (CO_2) recorders show the efficiency of boiler operation.

In the days of hand-fired operation a fireman's duties were practically entirely manual and his principal interest was to maintain his steam pressure at the required point. A modern fireman, aside from the labor of cleaning and dumping fires, is guided in his actions practically entirely by conditions of operation as indicated by the "tell-tale" instruments installed in the boiler-room.

JUST LIKE RAILROAD MEN

The following editorial from *The Sun*, New York, is worth reading several times.

"The meeting was called for 4 o'clock. At one minute before the appointed hour the attendant closed the doors. As he did so he took notice that all the chairs were occupied.

"The room and its furnishings were in taste with the architecture of the building. A long table occupied the center of the room. Lewis Cass Ledyard was in the chair set for the presiding officer. At his right hand was Cardinal Hayes. Next to the Cardinal sat J. P. Morgan, then came Payne Whitney and George F. Baker, Jr. At the table's end was Elihu Root and next to him Vincent Astor and Henry Walters. The engineering profession was represented by William Barclay Parsons and the law by two former Justices of the Supreme Court, Morgan J. O'Brien and Samuel Greenbaum, and by John G. Milburn and Frank L. Polk.

"At a sign from President Ledyard Mr. Whitney arose and proceeded to read the report of a committee of which he is chairman. It was the monthly meeting of the trustees of the New York Public Library. Every man was on time."

A man's country is not a certain area of land, but it is a principle, and patriotism is loyalty to that principle.—*G. W. Curtis.*

NEWSPAPER ADVERTISING

On pages 104 and 105 of this issue is shown a reduced copy of a full-page newspaper advertisement which appeared in rotogravure. Other full-page advertisements have appeared, all directed to the same general end. This end is to help build up the summer traffic. As compared with December there are about 300,000 fewer passengers riding per week-day in August. If a part of these people could be induced to use the Railway during the hot months the result would be improved service and more economical operation. The benefits all go to the public itself.

It is desirable that all employees be familiar with the Railway's advertising. The text of the first one shows clearly how intimately the "El" system is tied-in with the communities which it serves.

Every employee should read the text carefully, not only of this but of all of the advertisements. It is planned to reproduce other advertisements in coming issues of "Co-operation."

Supplementing the publication of sample advertisements in "Co-operation," the same and probably other advertisements will be reproduced in poster form, and placed on numerous bulletin boards in various parts of the property.

It is easy to fool yourself. It is more difficult to fool the people you work for. It is still more difficult to fool the people you work with and it is almost impossible to fool the people who work under your direction.—*Exchange.*

ACCIDENT PREVENTION IN BUS OPERATION

THE operation of buses by the Boston Elevated Railway is comparatively new. They require a different technique of operation from street cars. The accident chart shown in the January, 1927, issue of "Co-operation" indicates that the operators cut down the bus accidents materially in 1926 as compared with 1925. They are still running higher than the car accidents per 10,000 miles. All will agree that safe operation of buses is essential, hence the following answers from the June, 1926, accident-prevention examination speak for themselves:

QUESTION: What are the most frequent accidents in the operation of buses, and how can they be avoided?

ANSWER: Collisions between bus and autos. They can be avoided by slowing down and sounding gong at intersecting streets, putting hand out left window so the following car will know you are going to stop. Also be sure there is proper clearance.

QUESTION: Can the bus be stopped in the number of feet at a given rate as charted in motor vehicle rules and regulations? Does it make any difference whether the bus is empty or filled with passengers? If so, why?

ANSWER: The bus can be stopped in a shorter distance than the motor rules call for, but it is a poor practice except in case of emergency. Bus can be stopped empty quicker than loaded with passengers, for there is not so much weight to brake. It depends on the condition of the street, whether dry or wet. That is one thing you have to look out for when driving a bus.

QUESTION: What would you do if you saw a truck or auto coming toward you and several boys running in the street behind truck and trying to board it?

ANSWER: Reduce speed of bus, sound horn and pull over to far right-hand side of road ever ready to stop.

QUESTION: Are you familiar with the rules and regulations of the Registrar of Motor Vehicles, and which do you think are the most important, naming at least three in the order of their importance?

ANSWER: Reckless driving and speeding. Driving under the influence of liquor. Driving without license.

QUESTION: What type of automobile do you consider most necessary to avoid to prevent accidents and why?

ANSWER: Trucks with large enclosed bodies, or having a bulky load, because the view of the driver is somewhat obstructed and he may not give himself clearance enough. It is also difficult for the bus driver to have a clear view of the road ahead.

QUESTION: When you have an obstructed view and wish to pass a moving vehicle ahead of you, how much space do you allow ahead of you?

ANSWER: Three hundred feet and no intersecting streets, curves or grades.

QUESTION: What should you do in meeting a vehicle coming in the opposite direction? On a narrow street?

ANSWER: Slow down and pull over to right-hand side of street, and if it was too close I would stop and watch side of bus so I could signal him so he could pass, and there would be no damage.

QUESTION: What do you do in passing an electric car when passengers are boarding and alighting?

ANSWER: If there is room 8 feet from the car I pass slowly. If not I stop and wait until passengers are off car.

QUESTION: In moving traffic, what is the proper distance to keep from the vehicle ahead of you?

ANSWER: That is according to condition of road, weather, speed of traffic, day or night, and vision. Figure that car may stop suddenly and be prepared so you can stop. Keep your distance. Then you won't collide.

QUESTION: What are the causes of skidding?

ANSWER: Applying brakes too hard and quickly on wet or icy pavements and turning corners too quickly.

QUESTION: What type of motor vehicle driver do you find the most careless?

ANSWER: Young men out for pleasure, usually in company with other young men or women.

THE LOWLIEST TASK

Duty is never plainly defined to the man who would evade it, and opportunity is never fully revealed to him who seeks but the easy path to luxury. But to him who thinks only of the job at hand, the things to be accomplished, now; who recognizes in the lowliest task the importance of his job—and does it—to him added responsibility will beckon and at his door opportunity will knock time and again.—*Exchange.*

EDUCATIONAL COURSES ARE APPRECIATED

IN recent issues of "Co-operation" have appeared numerous commendations of the courses of instruction which have formed the educational program of the last year or two. Here are still more, from "El" men of different departments:

Public Speaking

"I have attended the class in public speaking and enjoyed as well as greatly profited by it in a number of ways. I am heartily in favor of continuing these courses by the company. As I see it, where there are about 8500 persons employed, both men and women working for the railroad, those especially who are in supervisory positions should gladly grasp this golden opportunity of improving themselves in an educational way as well as increasing their efficiency."

James Donohue, General Foreman,
Wire & Conduit Division, Power Dept.

"The public-speaking class teaches the student to speak in a clear concise and forceful manner. It also corrects self consciousness or stage fright, and enables one to bring out ideas that would be otherwise lost."

Reginald Middleton,
Electrical Assistant, Power Department.

"A public-speaking course teaches how to prepare and deliver a speech in an interesting, instructive manner, giving confidence in ability to properly impress the audience."

E. A. Kelley,
Asst. to Supt of Transportation.

"The public-speaking course has helped me: (1) to develop self-confidence; (2) to present facts in a concise manner; (3) to prepare and deliver a talk properly; (4) to converse interestingly; (5) to think more accurately; (6) to analyze my reading when assigned a topic for a talk; (7) to think well before speaking."

John B. Flaherty,
Supervisor, Treating Plant, Maintenance Department.

Automotive Maintenance

The automotive course presents clearly and briefly the essential principles of automobile construction and operation. It is of great value to bus drivers and supervisory officials when faced by ordinary operating troubles on the street.

Ambrose Griffith,
Inspector, Div. 3.

The automotive-maintenance course, especially the illustrations and lectures, has given me a clearer and most beneficial understanding of all subjects pertaining to the automobile.

Herbert M. Benner,
Clerk, R. S. & S. Dept.

A pilot may steer the ship, but the captain's knowledge makes him master of it. An automotive course may promote you from "pilot" to "master."

Albert A. Ordway,
General Storekeeper, R.S.&S. Dept.

Current Events

"I found the course on current events very interesting and instructive. The presentation of a consensus of public opinion upon questions of great public interest given by an unbiased expert authority, reveals the difficulties and complexities of such questions. This should make the hearers less prone to snap judgment, more thoughtful and intelligent citizens and more interesting socially. Thus their opinions of such matters would be more desirable and convincing. I think that if questions of local interest pertaining to the "El" road and its future could be introduced, also such subjects as tariff, vs. free trade, states' rights vs. centralization, etc., the course would be second to none in interest and profit."

J. H. Rudge, Armature Winder,
Sullivan Square Shops.

Foreman Training

This course in my estimation is of such value to the men in supervisory positions that it really is a loss to have anyone fail to take advantage of it.

J. A. Griffin,
Supervisor, Div. 4.

Among the advantages of foreman training, aside from the social contact with numerous foremen, talks by outside experts are beneficial. To my mind also the use of questionnaires is helpful as it impels men to dig for the answers. This is very educational.

Rudolph Kundert,
Foreman, Machine Shop.

GUIDE AND INFORMATION BOOKS EASY TO GET

A large supply of the Boston Elevated Guide and Information Book is carried at the Park Street information booth for the convenience of passengers and employees. The co-operation of all employees will assure profitable circulation of the folder among patrons of the Railway who can use our service better if they know more about it.

NEW BUSES WITH GAS-ELECTRIC DRIVE

Railway Is Trying Out This New Type of Equipment Which Has Proved Popular in Some Parts of the Country—This Drive Weighs More

AMONG recent purcchases of buses by the Railway are three equipped with gas-electric drive, representing two prominent makes. In buses of this type the engine drives an electric generator through a flexible coupling. The electric power thus produced is fed to one or two electric motors which drive the rear axle by means of one or two propeller shafts. Current is controlled through a hand-operated controller which operates as a switch. The motors are of the series type, similar in principle to those used under an electric car, and the drive as a whole possesses much of the flexibility of electric-car control. The advantages claimed for this type of control as compared with the usual clutch and gear box are so attractive that in some sections of the country gas-electric drive has been adopted on a large scale. The management of the Boston Elevated Railway has been watching this development from the beginning but has realized that much improvement yet remains to be made. An expert for a manufacturer of this type of bus recently stated publicly as follows:

"There is no question that there is a great deal yet to be accomplished before we can talk of standardization and that in the current state of the art any improvement is a step in the right direction, because I believe the present status of the electric drive has reached the point where it will have to stand or fall on its economic merits. Its inherent advantages have rendered it popular with bus riders but some disadvantages must be overcome before completely winning the confidence of the operators and claiming the place it rightly deserves by principle in the field of automotive transportation."

Advantages and Disadvantages

The principal advantage claimed for gas-electric drive is its smoothness of operation. Its acceleration is particularly steady and the control is flexible. This is both economical and pleasing to riders. As a result of the quick and smooth starting this type of drive commends itself for use in congested traffic and, it is claimed, permits permanent increase in schedule speed. In short, the evils of gear shifting are done away with. This permits the operator to concentrate his attention on his main duties.

To offset the excellence of control there are several disadvantages. The addition of electric machinery increases the cost of a bus and, of course, the weight. Gas-electric drive weighs from 1250 to 1650 pounds more than the usual drive. Under most conditions the efficiency is lower, as the power has to be transformed into electrical form and back again into mechanical form. This is particularly true in a vehicle where the power is low per unit of weight. The result of the greater weight and lower efficiency is naturally greater fuel consumption.

The balancing of the advantages and disadvantages against each other is, as suggested above, an economical problem. Are the advantages worth what they

ONE OF THE NEW GAS-ELECTRIC BUSES

cost? This is a question which the Railway is determining experimentally. One of the new buses has a single-motor drive, the others double-motor drive. There are other differences. The buses will be tested out under service conditions and time will tell whether locally they are superior.

The question is not one of commercial rivalry, because bus makers are prepared to furnish either mechanical or electrical drive as desired.

EVERYONE'S RESPONSIBILITY

A railroad president traveling in a western state inquired of a lone railroad hand who was renewing the grease in the axle boxes of passing freight trains, "What is the most important thing about your job?"

"The important thing in my job?" he exclaimed in utter astonishment, "What can be important in greasing wheels?" "Think it over," was the response of the traveler; "You'll find it."

A number of years later a well-dressed man accosted this railroad president in a New York office building. "You don't remember me," he said. "I'm the car greaser you talked to out West several years ago. You told me to look for the important things in my job, and left me guessing. Well, I looked and discovered that the length of time I held those trains was an important item, so I started out to cut down the time we held them over by about two-thirds. One day some months later the superintendent paid me a visit to find out what I was doing to get the trains away so quickly. The result was that I got a chance at a better job. Now I'm division superintendent, with many men under me and I'm still looking for the important things in my new work, and I'm telling the boys to do the same thing.—*La Salle Bulletin.*

Above from "The Hoosierite," July 7, 1927.

PRESERVE YOUR FILES OF "CO-OPERATION"

The monthly issues of "Co-operation" contain so much reference information regarding the property that it is highly desirable to preserve complete files for reference.

The early issues are already going out of print and it is impossible to complete any more files back to the beginning.

Where employees have nearly complete sets except for a few numbers, or sets dating back a year or two, it may still be possible to supply back numbers.

An endeavor will be made to do so if requests are sent in through officials or directed to the general manager's office.

ALUMINUM IN CAR CONSTRUCTION

Much interest was created by a car built practically entirely of aluminum which was shown at the Cleveland convention of the American Electric Railway Association last October. It was built by the Cleveland Railway and has since been operating in Cleveland. The car is more than 25 per cent lighter than the corresponding steel car used in Cleveland, but is less than 600 pounds lighter than the corresponding steel car used in Boston, namely the No. 5-A-2. The Boston steel car is about 6 feet shorter than either of the Cleveland cars, but the seating capacity is practically the same and the standing capacity is greater.

The No. 5 car has the variable-load brake which adds considerably to the weight; on the other hand the body of the No. 5 car is more than 1000 pounds lighter than the body of the aluminum car.

Another element to be considered in comparing weights is that the Cleveland car is a single-end car, whereas the Elevated No. 5 is double-end. This necessitates on the latter car duplicate trolleys and vestibule equipment, such as platform controllers, air and hand brakes, sanding devices, illuminated signs, etc. This fact might easily account for 500 pounds of additional weight on the No. 5 car.

All of this is no disparagement of the interesting experiment which is being made in Cleveland jointly, it is understood, by the Cleveland Railway and the Aluminum Company of America, but simply indicates that no great reduction in weight could be expected by the substitution of aluminum for steel in our No. 5 car.

"De trubble wid de man what knows it all is—dat he talk so much he ain't got no time to git no information."—*Commonwealther.*

What Do You Know About the "El"?

NEW QUESTIONS

56. What was the definition of "service to the public" as given in the "El" advertisement of June 25 in a Boston newspaper?
57. How did the Railway provide against bus breakdown in moving troops to Camp Devens on July 7?
58. How many buses with gas-electric drive has the Railway in operation, and of how many makes?
59. What railway has in operation a car made almost entirely of aluminum?
60. Which station on the Dorchester Rapid-Transit Extension will be completed first?
61. At this station what provision has been made to facilitate entrance from Dorchester Avenue?
62. What will be the rated boiler-horsepower of the boiler plant at South Boston Power Station when present improvements are completed?
63. How many kilowatts of electrical power will this boiler-horsepower produce?
64. Which boilers at this plant burn pulverized coal?
65. When was service started on the Beacon Street de luxe bus line?

ANSWERS TO LAST MONTH'S QUESTIONS

46. How much energy in kilowatt-hours was produced in the "El" power plants in 1926?
    Ans. 257,696,595 kilowatt- hours. (Co-operation," June, 1927, p. 85.)
47. How does the "El" rank as an electric power producer?
    Ans. Third among electric railways and steam railroads in the United States. ("Co-operation," June, 1927, p. 85.)
48. What is the purpose of the automatic control recently installed in the power plant at Everett?
    Ans. To start and stop the frequency converters as required by changes in load; also to protect them against abnormal operating conditions. ("Co-operation," May, 1927, p. 67.)
49. How many men have been in the "El" service over fifty years?
    Ans. Twelve. ("Co-operation," May, 1927, p. 70.)
50. How much was the reserve fund under $1,000,000 on May 1?
    Ans. Approximately $100,000. (See chart, "Co-operation," May, 1927, p. 80—back cover.)
51. How much greater was the percentage of gross revenue spent for maintenance in 1926 than the percentage for 1916?
    Ans. 9.4 per cent, i. e., 26.6—17.2=9.4 per cent. (Table p. 88, "Co-operation," June, 1927.)
52. In which recent month was the average number of weekday passengers on the "El" the greatest in the history of the Railway?
    Ans. December, 1926. (See traffic diagram, "Co-operation," May, 1927, p. 73.)
53. Who are respectively the superintendents of the R. T. L., Div. 1, Div. 2, Div. 3 and Div. 4?
    Ans. R. T. L., H. A. Pasho; Div. 1, C. A. Bauch; Div. 2, A. W. Senter; Div. 3, J. H. Harrington; Div. 4, A. S. Scott.
54. Approximately what is the Railway's monthly bus-mileage?
    Ans. Nearly 500,000 miles. (See back cover of recent issues of "Co-operation," also diagram p. 75, May issue.)
55. How much fuel is used per year in the "El" shops to supply the oil furnaces, the forges, and the case-hardening furnace?
    Ans. Fuel oil, 52,000 gallons; coal, 300 tons. (See "close-up," p. 71, "Co-operation," May, 1927.)

CHANGES IN THE RESERVE FUND

Fiscal Year 1925-26

July 1, 1925, $1,000,000

July	$249,477.93*	Jan.	$223,30190†
Aug.	367,593.94*	Feb.	185,989.63*
Sept.	176,763.97*	Mar.	161,772.65†
Oct.	117,703.96†	April	77,031.69†
Nov.	45,265.00†	May	57,010.06†
Dec.	289,347.71†	June	1,662.18*

Profit and loss credit....$32,359.07

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†Excess of revenue over cost of service.

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	$393,028.41*	Jan.	$186,947.50†
Aug.	451,546.79*	Feb.	92,018.37†
Sept.	236,543.80*	Mar.	256,586.83†
Oct.	2,723.19†	April	181,694.29†
Nov.	29,302.22†	May	113,284.72†
Dec.	234,879.91†	June	92,917.54*

Profit and loss credit..... ..$137,259.76

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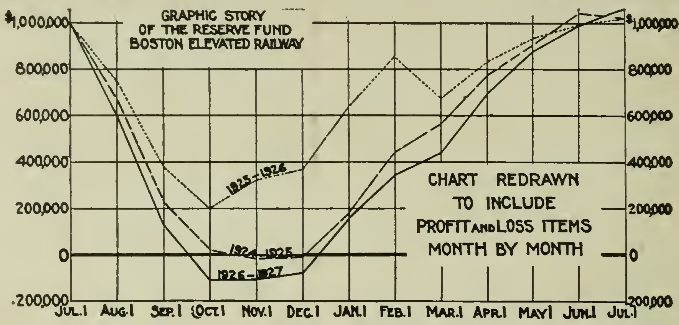
*Excess of cost of service over revenue



JUNE OPERATION

GENERAL FINANCIAL DATA	1927	1926
Cost of service exceeded revenue	$92,917.54	$1,662.18
Operating revenue per car-hour (A.E.R.A. std.)	$6.08	$5.67
Operating revenue per car-mile operated	61.81c	58.54c
Average fare per revenue passenger	9.271c	9.284c
Ratio operating expense to operating revenue	74.24%	71.38%
PASSENGERS CARRIED		
Revenue passengers	29,167,572	29,831,144
Per cent 5c and 6c passengers	17.75%	17.43%
Revenue passengers per car-mile operated	6.466	6.112
OPERATING FACTS		
Trips operated	582,933	635,014
Car-miles operated:		
Rapid-transit lines	1,143,120	1,256,786
Surface, two-man	1,661,246	2,004,188
Surface, one-man	1,242,905	1,210,184
Express, newspaper and sprinkler cars	1,028	5,650
Motor bus	463,927	404,352
Total miles operated	4,512,226	4,881,160
ACCIDENT DATA		
Accidents per 10,000 car-miles	2.01*	2.15*
Accidents per 10,000 bus-miles	2.48*	3.14*
Revenue passengers carried per reported accident	20,130	17,384
Average number of witnesses per accident	3.5	3.7
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	8	8
Employees complained of by car riders	75	85
Car defects reported per 10,000 car-miles	3.5	3.7
INFORMATION ABOUT POWER		
D.c. kw.-hr. output gross per month	15,963,240	17,243,970
Maximum kw. load	56,600	60,260
Tons of coal consumed	13,947	15,287
Lbs. of coal burned per d.c. kw.-hr. at cars	1.963	1.991
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	1.180c	1.085c
Per revenue car-mile	4.21c	3.85c
Kw.-hr. per revenue car-mile	3.566	3.548

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*This does not include miscellaneous accidents or derailments.

July 23, 1927. EDWARD DANA, *General Manager.*

BOSTON ELEVATED RAILWAY

CO-OPERATION

Volume 6 AUGUST, 1927 Number 8

Boston Elevated Close-Ups

THE R. T. L. COLLECTOR

(See Page 118)

To All 'El' Employees

THE Boston Elevated Railway has had for years an excellent reputation for safety. In 1914 it was awarded the Brady medal by the American Museum of Safety for having the most conspicuously creditable accident record.

In spite of this excellent record there are still far too many accidents and a concerted movement has been planned to reduce the number.

The program comprises two major divisions:

1. Study by experts of the actual accident situation on the property.

2. The application of the information thus secured to assist the employees in improving their records.

Studies already made show that some men are more prone to accidents than others. The reasons for this will be studied and suggestions will be made to such men as to how they can do better.

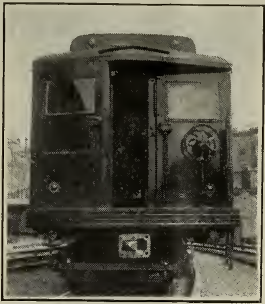
Many employees have almost perfect records while others seem to have the accident habit.

To better our accident record for the coming year will require the hearty co-operation of all employees. I know that I can count upon you for the same kind of co-operation in this worthy movement that you have given me in other directions.

Edward Dana

CARS FOR RAPID-TRANSIT EXTENSION

New Rolling Stock Embodies Several Minor Improvements Tending to Reduce Weight, Simplify Cleaning and Increase Attractiveness—Doors Slide on Outside of Body



AN important feature of the rapid-transit extension from Andrew Square to the Ashmont Station is the addition of sixty new cars to the rolling-stock for use on the extended line from Harvard Square to Ashmont Station. This will bring the number of cars assigned to this line to 155. These cars are now arriving and the accompanying illustrations show their appearance. The first five cars were received on July 29 from the Osgood Bradley Car Company, Worcester, which is building the entire order.

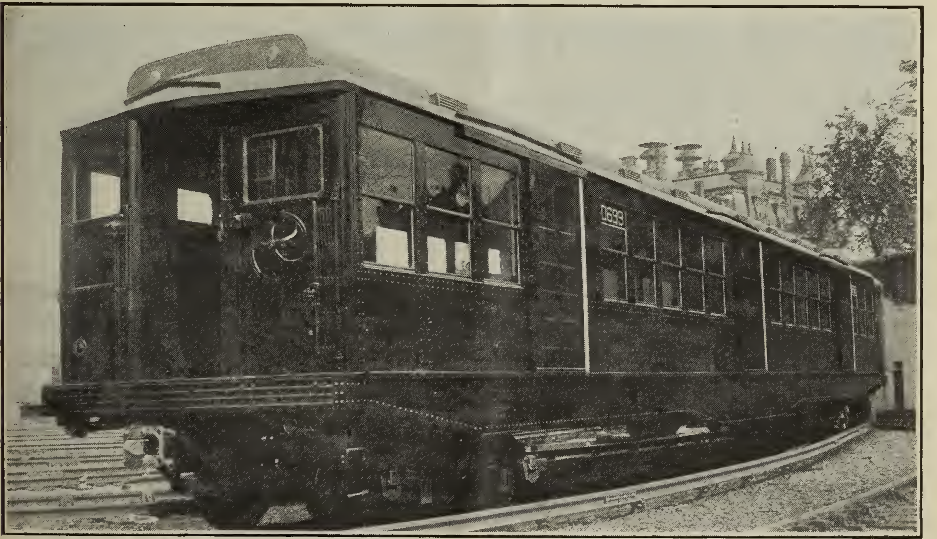
The new cars are in general like the present Cambridge subway cars but have some features not embodied in the old ones.

The general dimensions are the same as those of the last cars purchased but, owing to changes in design, floor construction, etc., a slight saving in weight has been made. The approximate weight of the new cars when equipped will be 84,500 pounds.

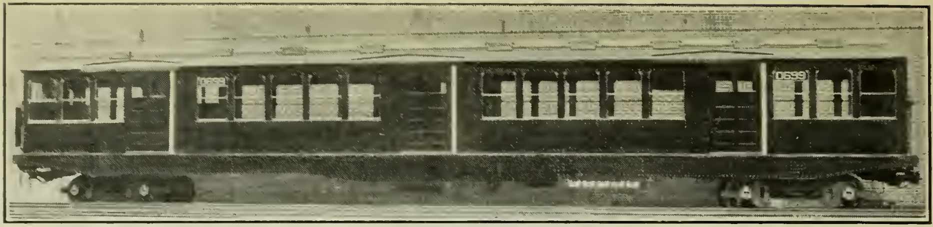
The most noticeable difference between the old and new cars is that in the new ones the side doors slide on the exterior of the car rather than in pockets built into the sides of the car. Further, the doors are electrically instead of pneumatically operated.

The lighting system consists of ten pendant-type lighting fixtures placed in a single row in the center of the car. They have white-bowl, glass reflectors and are being equipped with 94-watt lamps. Interspersed with these are five emergency-lamp fixtures with similar but smaller reflectors. The emergency lamps are for use only in case the regular source of light fails.

Another feature in these cars is the provision for heat in the mo-



FIRST OF THE SIXTY NEW CARS



THE VERTICAL WHITE BANDS ARE THE RUBBER DOOR CUSHIONS

torman's cabs. This is accomplished by the use of a duct, encasing one of the regular heaters, which conducts warm air through a grill in the cab partition into the cab.

An added feature in connection with the window sashes is the use of so-called "sanitary corners." These corners cover both sides of the glass at the sash corners and simplify greatly the cleaning of the glass.

The cars are equipped with wood-slat seat cushions and backs in the interest of cleanliness. To the same end, hand-straps of white porcelain are used.

The new cars were delivered first to the Eliot Square shops, but they will be stored at the Andrew Square end of the extension, where the track is entirely completed.

TO BUILD UP SUMMER TRAFFIC

During July and August there have been appearing in Boston newspapers full-page advertisements of the Boston Elevated Railway, designed to stimulate summer riding. In the June issue of "Co-operation" a full-page rotogravure advertisement, reduced in size, was reproduced. On pages 120 and 121 of this issue appears a second advertisement reproduced from a full page in colors. As at present scheduled there will be at least twelve advertisements in the series. It will not be practicable to print all of them in "Co-operation," but it is probable that all will be posted on bulletin boards on a reduced scale, so that every employee may be familiar with the details of the advertising.

WHO PROFITS MOST?

Who profits most?
'Tis not the man
Who, grasping every coin he can
Unscrupulously crushes down
His weaker neighbors with a frown.
He is not worthy of his trust,
And, friendless, knows his gold is dust.
He loses what he sought to gain
And finds, instead of pleasure, pain.

Who profits most?
It is not he
Who shirks responsibility,
Who, hermit-like, himself withdraws
To live apart from human flaws
To scoff at mortal frailties.
He turns away, no vision sees
Of life's great opportunity.
He is not mourned—why should he be?

Who profits most?
It is the man
Who gives a boost where'er he can,
Who's on the square in all that's done,
And trusts and helps the others on;
Who puts his task above mere self
And values friends and counts them wealth.
Who profits most? Is that your quest?
It is the man who serves the best.

—Exchange.

A recent issue of "The Review," published by the Master Builders' Association of Boston, emphasizes the importance of courtesy in the building business. These words apply as well in the transportation industry:

"The exercising of courtesy seems to us particularly essential for the maintenance of friendly relations where so much depends, as it surely does in building work, upon co-operation."

Success is not made by lying awake at night, but by keeping awake in the daytime.—*Commonwealther.*

WHAT DO YOU KNOW ABOUT THE "EL"?

ANSWERS TO LAST MONTH'S QUESTIONS

56. What was the definition of "service to the public" as given in the "El" advertisements of June 25 in a Boston evening newspaper?

Ans. Modern cars transporting passengers from point to point at minimum cost of carefully maintained roadbeds, protected by the best signal and safety devices available, escalators in and about the stations, courtesy and genuine interest in the welfare of passengers as expressed by 8500 employees. (See "Co-operation, July, 1927, p. 105.)

57. How did the railway provide against bus breakdown in moving troops to Camp Devens on July 7?

Ans. Each of the four groups of buses was accompanied by a repair truck equipped for any kind of emergency. (See "Co-operation July, 1927, p. 103.)

58. How many buses with gas-electric drive, of how many makes, has the railway in operation?

Ans. Three buses of two makes. (See "Co-operation," July, 1927, page 109.)

59. What railway has in operation a car made almost entirely of aluminum?

Ans. The Cleveland Railway. (See "Co-operation," July, 1927, page 110.)

60. Which station on the Dorchester Rapid Transit Extension will be completed first?

Ans. Columbia Station. (See "Co-operation," July, 1927, p. 99.)

61. At this station what provision has been made to facilitate entrance from Dorchester avenue?

Ans. A stairway has been provided leading from the foot of Carson street to the street level on Columbia road close to the station entrance. (See "Co-operation," July, 1927, p. 102.)

62. What will be the rated boiler-horsepower of the boiler plant at South Boston Power Station when present improvements are completed?

Ans. 19,800 boiler-horsepower. (See "Co-operation," July, 1927, p. 106.)

63 How many kilowatts of electrical power will this boiler-horsepower produce?

Ans. 95,000 kilowatts (See "Co-operation," July, 1927, p. 106.

64. Which boilers at this plant burn pulverized coal?

Ans. One 600-horsepower boiler and two 2075-horsepower boilers. (See "Co-operation," July, 1927, p. 106.)

65. When was service started on the Beacon street de luxe bus line?

Ans. On May 16, 1927. (See "Co-operation," July, 1927, p. 103.)

CHANGES IN PENSION LIST

Since the last supplementary list of pensioners was printed in "Co-operation" in May, 1927, 26 names have been added to the list as follows:

Peter J. Callahan, stockman.
Peter J. Clark, car cleaner.
William Thompson, operator.
Richard Cantwell, crossing tender.
J. F. Cranston, inspector.
Smith Crowe, crossing tender.
L. W. Donald, motorman.
Joseph Foster, warder.
J. D. Lynch, foreman.
E. E. Maxcy, motorman.
J. G. McLeod, motorman.
Philip Morrison, motorman.
N. R. Shaw, motorman.
R. H. Stevens, crossing tender.
A. H. Chamberlain, conductor.
N. Repucci, trackman.
P. J. Finneran, crossing tender.
Edward J. Gallagher, motorman.
Philip J. Doherty, operator.
George C. Doherty, sheet-metal worker.
Timothy Phelan, starter.
Michael Tierney, paver, Div. 2 Rd. Dept.
James Feeney, conductor.
Fred F. Grant, starter.
M. P. O'Reilly, motorman.
J. R. McGillivray, machinist.

Also, since the previous list was published the following pensioners have died:

Ben W. Coffin, conductor Div. 2.
Michael J. Doyle, special officer.
John J. Mahoney, conductor, Div. 1.
Joseph P. McCue, operator, Div. 2.
John Penning, warder, R.T.L.
John Brewing, painter.
Patrick Kane, trackwalker, Div. 4.
Chris. R. Proudfoot, foreman Div. 3, Maint. Dept.
Joseph C. Smith, gateman, R.T.L.
Nathan R. Shaw, motorman.
Hugh McElroy, helper.
Joseph F. Brown, cash counter.
Newell P. Murch, gateman, R.T.L.

These changes bring the total number of names (August 1) to 389, an increase of 13 since May.

The number reported in the August, 1926, issue of "Co-operation," just one year ago, was 343. This is an increase for the year of 46 or 13.4 per cent. Roughly, the ratio of pensioners to employees is now 389 ÷ 8500, or 4.53 per cent.

What a lot of trouble has been caused by that girl, Miss Cal Culation!—*Commonwealther.*

◆

Be sure, my son, and remember that the best men always make themselves.—*Patrick Henry.*

ELEVATED CLOSE-UPS

The Collector

(See illustration on front cover)

FOR the front cover illustration this month a collector has been selected, representing about 250 women employed on the rapid-transit lines. These employees collect more than half of the Boston Elevated Railway revenue.

The duties of the collector include collecting fares, making change, and issuing transfers. Each collector is responsible for the proper handling of all money, tickets and transfers entrusted to her. At the end of her period of duty each day she accounts for these three items on a daycard, and then deposits her receipts for the day in a safe provided for them. This deposit is personally witnessed by an official at the station.

Besides collecting proper fares and issuing transfers, collectors are required to prohibit obnoxious persons from entering stations. They are required to be prompt in reporting for work and to remain on duty until the station is closed. At one station there is a collector on duty all night to collect fares and issue transfers to night-car passengers.

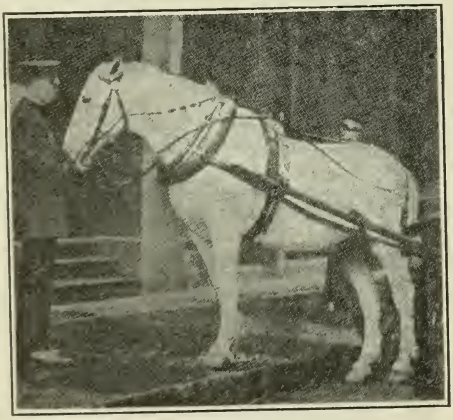
In the event of misunderstanding or controversy with passengers, the collector is required to call the station official, but in his absence is expected to use good judgment and tact at all times, giving passengers the benefit of any doubt. The aim is to avoid giving rise to complaints from passengers. Due to their close contact with the public it is essential that all collectors be alert and courteous at all times, and accurate in their dealings as well.

Collectors select their positions according to seniority. Each one is allowed a day off each week. All collectors who have completed one year's service are entitled to two weeks' vacation, picked according to seniority. Those who have only completed six months' service are entitled to one week's vacation.

Women were first employed as collectors by the Boston Elevated Railway in November, 1905.

A COUPLE OF PALS

This picture from the *Boston Post* shows a horse which is driven by William Norton of the maintenance department, Lenox Street, Div. 2. Mr. Norton is assigned to the purchasing department by the maintenance department to take care of deliveries of miscellaneous materials for that department to the Boston houses around town. He also does miscellaneous distribution work for other departments. Mr. Norton's contacts through this delivery work bring him into touch with many Elevated employees.



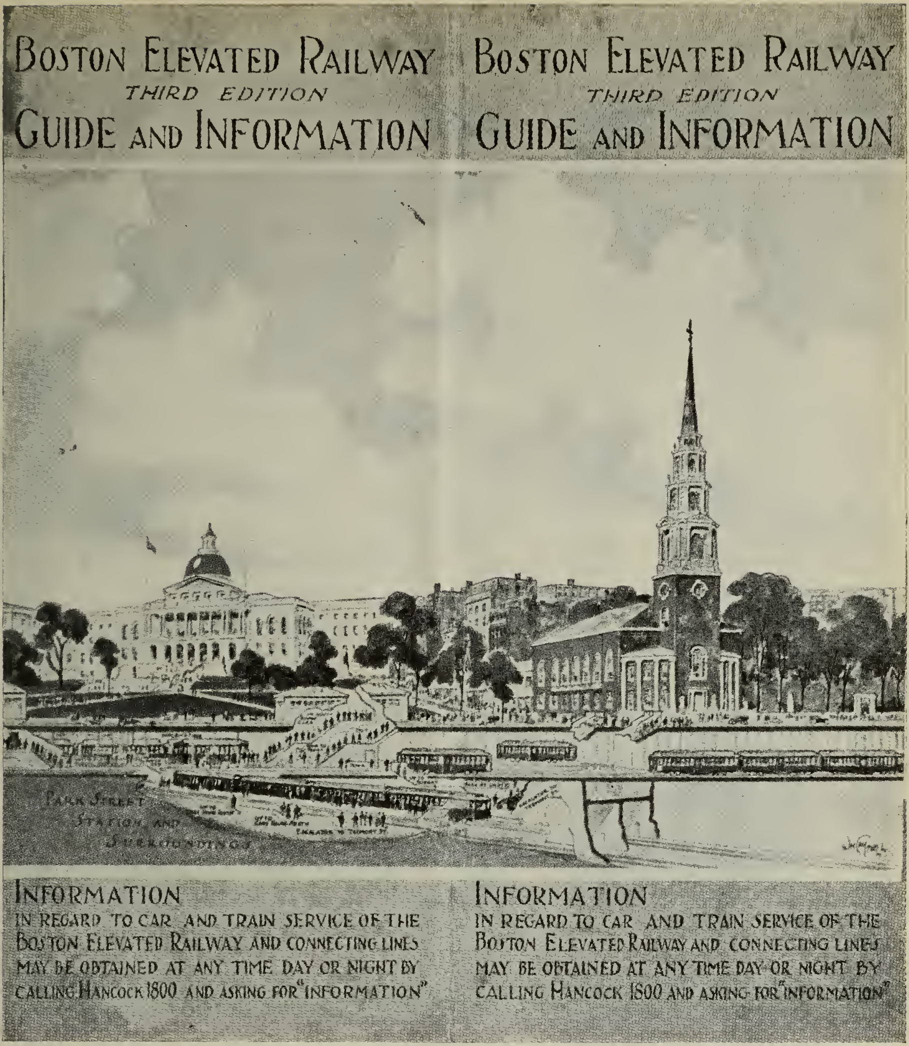
APPRECIATION

The picture shows the horse with Patrolman John H. Fisher of Division 20, traffic squad. The horse makes a stop each day about the same time at the point where Patrolman Fisher is located. When he spies the officer he mounts the sidewalk and gets his daily ration of sweets.

"EL" AS BUS OPERATOR

The Bus Division of the American Automobile Association has issued "Bus Facts for 1927." From this it appears that among the electric railways operating buses the Boston Elevated stands fourth in number of buses operated. Ahead of it are: Public Service Railway, Newark, N. J. (1204 buses); Philadelphia Rapid Transit Company (369 buses); City of Detroit, Dept. of Street Rwys. (303 buses).

Other electric railways operating more than 100 buses are as follows, in order: Northern Ohio Power & Light Company (213 buses); Virginia Electric & Power Company (209 buses); Detroit United Railways (194 buses); Milwaukee Elec. Rwy. & Light Company (136 buses); Pacific Electric Railway (125 buses); Shore Line Motor Coach Co., Indiana (124 buses); Connecticut Company (113 buses); Cleveland Railway (111 buses); Los Angeles Railway (103 buses); Twin City Rapid Transit Company (102 buses).



BOSTON ELEVATED RAILWAY
THIRD EDITION
GUIDE AND INFORMATION

Park Street Station and Surroundings

INFORMATION
IN REGARD TO CAR AND TRAIN SERVICE OF THE BOSTON ELEVATED RAILWAY AND CONNECTING LINES MAY BE OBTAINED AT ANY TIME DAY OR NIGHT BY CALLING HANCOCK 1800 AND ASKING FOR "INFORMATION"

BOSTON ELEVATED RAILWAY
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THIRD EDITION OF "GUIDE AND INFORMATION"

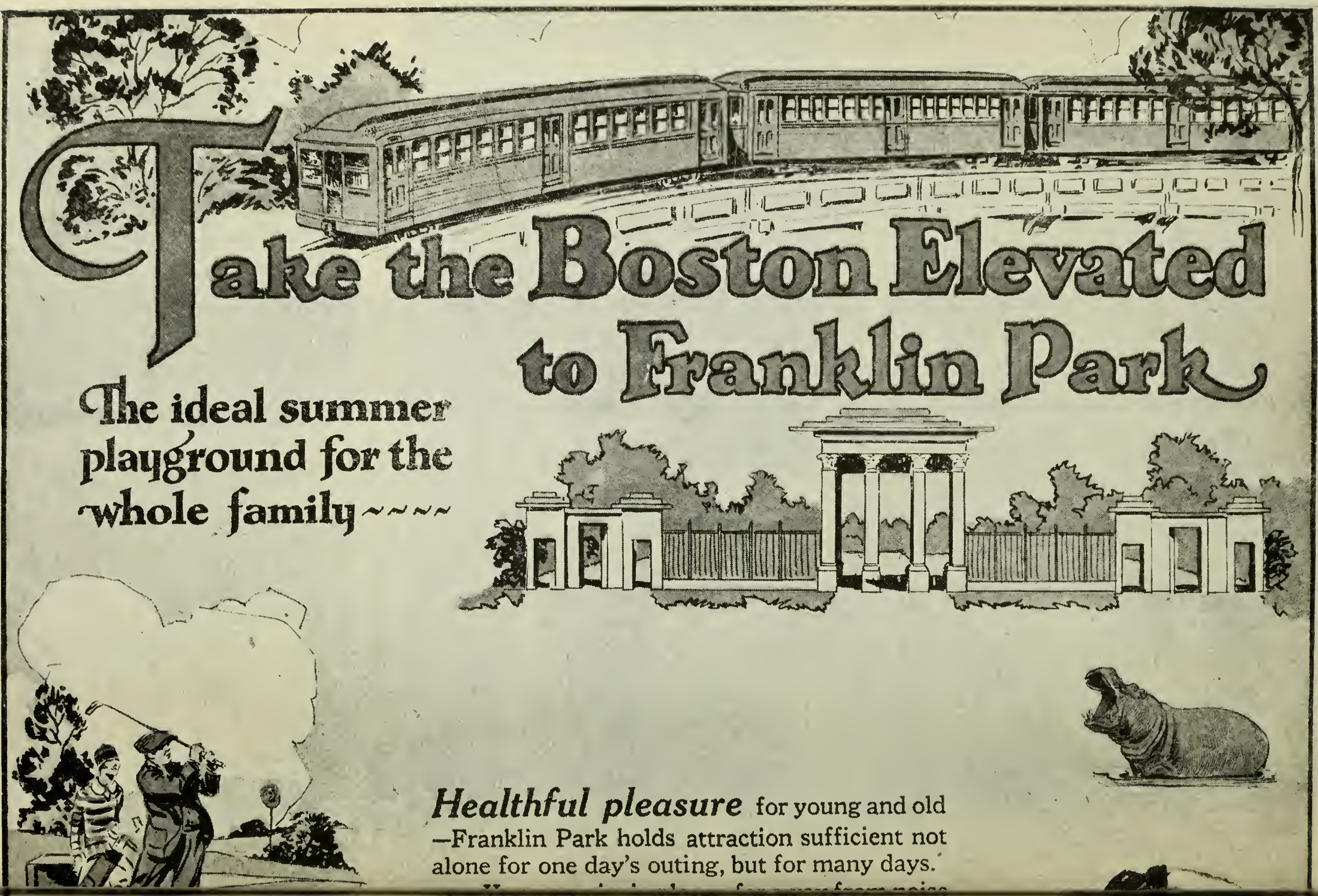
THERE has just come from the press an edition of 50,000 copies of the folder which is distributed to tourists and others who desire information regarding the Railway. Copies are being furnished to all employees so that they may familiarize themselves with the new edition and be able to furnish information to patrons.

As compared with the second edition, issued late in 1926 and comprising 100,000 copies (see "Co-operation, September, 1926), the third edition is designed to stimulate riding as well as to furnish specific information desired by users of the service. Thus, special display articles are used to direct attention to typical features of interest such as Franklin Park Zoo, the golf links available in our territory, etc. Information regarding routes has been brought up to date, and the Dorchester Rapid-Transit Extension is featured.

The third edition has been made smaller than the second, with the idea of bringing out future editions at more frequent intervals. This will permit keeping the folder up to date and directing attention to features of special interest.

The cover has been improved by the addition of a headband which will be visible when the folders are displayed in racks such as are used in hotels and elsewhere.

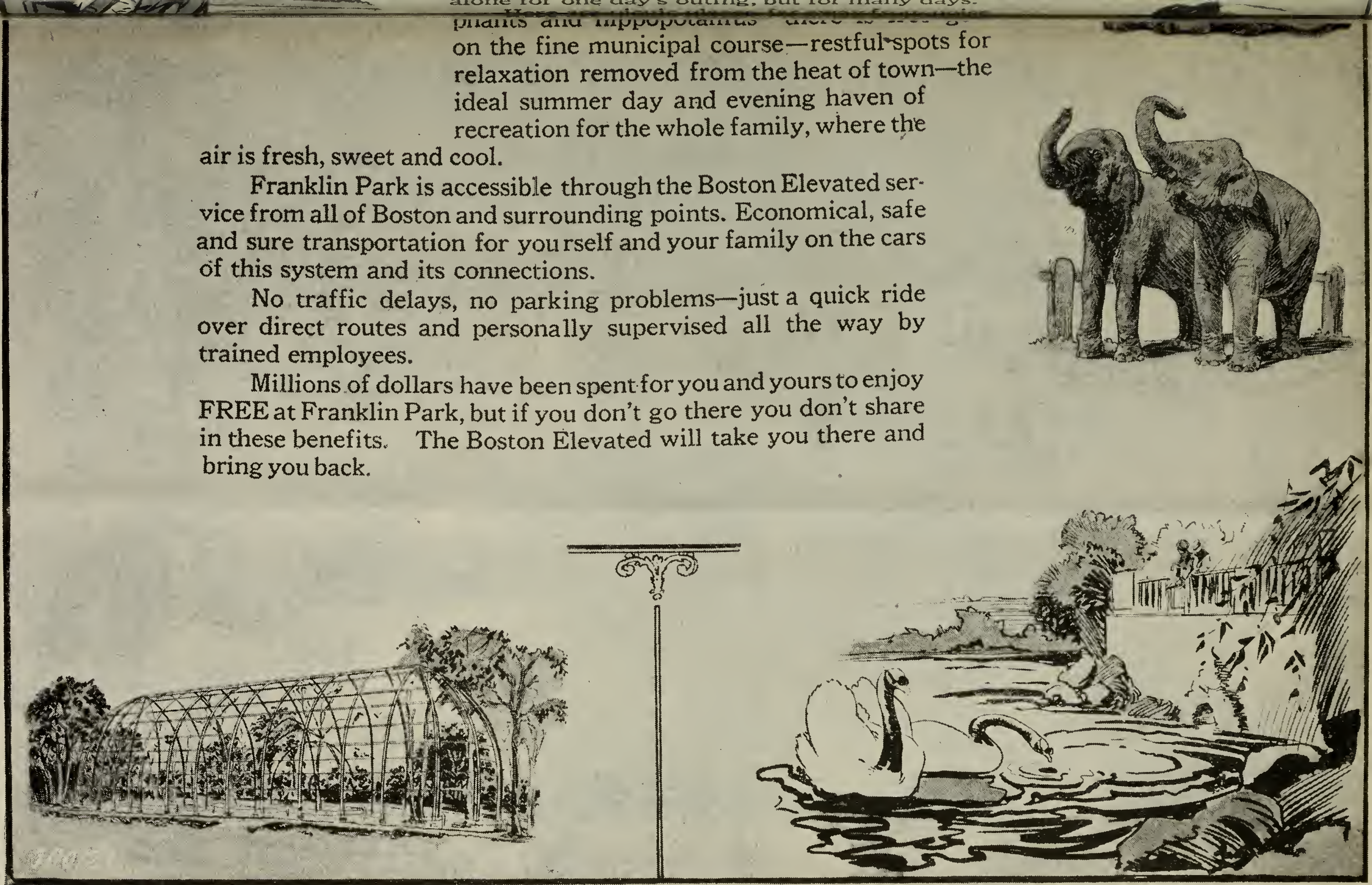
The large, colored map, which is the central feature in the folder, has been revised to show route changes practically up to date.



Take the Boston Elevated to Franklin Park

The ideal summer playground for the whole family~~~~

Healthful pleasure for young and old —Franklin Park holds attraction sufficient not alone for one day's outing, but for many days.



alone for one day's outing, but for many days.

phants and hippopotamus—there is free g
on the fine municipal course—restful spots for relaxation removed from the heat of town—the ideal summer day and evening haven of recreation for the whole family, where the air is fresh, sweet and cool.

Franklin Park is accessible through the Boston Elevated service from all of Boston and surrounding points. Economical, safe and sure transportation for yourself and your family on the cars of this system and its connections.

No traffic delays, no parking problems—just a quick ride over direct routes and personally supervised all the way by trained employees.

Millions of dollars have been spent for you and yours to enjoy FREE at Franklin Park, but if you don't go there you don't share in these benefits. The Boston Elevated will take you there and bring you back.

REDUCTION OF A FULL-PAGE NEWSPAPER ADVERTISEMENT WHICH APPEARED IN COLORS

A CHART OF REVENUE MILEAGE

On page 123 appears a diagram which summarizes in convenient form for study the revenue-mileage data of the railway over a long period. The diagram shows in graphical form the data tabulated below.

By means of this chart it is possible to trace several important developments on the property. Thus rapid transit is seen to have begun in 1901. The rapid-transit revenue-mileage for 1901 was about one and one-half millions as compared with over fifteen millions at present. This is an increase of ten to one. In twenty years the rapid-transit revenue-mileage has about doubled.

For the past few years the 2-man car mileage has been falling off gradually as the 1-man mileage (surface car and bus) has been on the increase. One-man car operation began in 1919 and increased steadily, until today it is almost as great as the rapid-transit mileage and more than one-half as great as the 2-man car mileage. Of the total surface-line mileage at present, 1-man cars provide one-third, 2-man cars slightly over one-half and buses the remainder.

The bus development, while still small as compared with other forms of transportation, has increased rapidly since it was inaugurated early in 1922. The mileage doubled in 1926 as compared with 1925 and was five times as great in 1926 as in 1924. Bus-mileage is now about one-third as great as the 1-man car mileage and one-fifth as great as the 2-man car mileage.

Below the table on this page are listed some important dates in the history of the Boston Elevated Railway. It would be a profitable mental exercise for each one of us to commit this list to memory. And soon it will be necessary to add to this list another item, namely, the opening of the Dorchester rapid-transit extension to Fields Corner. This will occur in less than four years from the change-over of the East Boston tunnel.

REVENUE MILEAGE—BOSTON ELEVATED RAILWAY

(See Chart, Page 123)

	Rapid Transit Lines	Surface Lines				Total Passenger Service
		Two-Man Cars	One-Man Cars	Motor Buses	Tot. Surface Lines	
1898 Year Ending Sept. 30......	——	32,209,150	——	——	32,209,150	32,209,150
1899 “ “ “	——	34,594,224	——	——	34,594,224	34,594,224
1900 “ “ “	——	38,171,984	——	——	38,171,984	38,171,984
1901 “ “ “	1,516,175	42.115,209	——	——	42,115,209	43,631,384
1902 “ “ “	5,725,455	40.047,381	——	——	40,047,381	45,772,836
1903 “ “ “	7,086,634	40,390,068	——	——	40,390,068	47,476,702
1904 “ “ “	7,004,579	41,313,402	——	——	41,313,402	48,317,981
1905 “ “ “	7,045,174	41,024,230	——	——	41,024,230	48,069,404
1906 “ “ “	7,718,735	42,337,873	——	——	42,337,873	50,056,608
1907 “ “ “	7,802,457	44,027,731	——	——	44,027,731	51,830,188
1908 “ “ “	7,806,503	43,818,640	——	——	43,818,640	51,625,143
1909 “ “ “	7,295,450	43,599,806	——	——	43,599,806	50,895,256
1910* 9 Months to June 30......	6,234,976	32,890,016	——	——	32,890,016	39.124,992
1911 Year Ending June 30......	8,523,434	45,895,457	——	——	45,895,457	54,418,891
1912 “ “ “	9,362,316	45,202,162	——	——	45,202,162	54,564,478
1913 “ “ “	11,385,787	46,118,784	——	——	46,118,784	57,504,571
1914 “ “ “	11,647,877	45,973,201	——	——	45,973,201	57,621,078
1915 “ “ “	12,081,986	45,306,117	——	——	45,306,117	57,388,103
1916 “ “ “	12,920,965	45,415,479	——	——	45,415,479	58,336,444
1916* 6 Months to Dec. 31......	6,680,159	23,040,402	——	——	23,040,402	29,720,561
1917 Year Ending Dec. 31......	14,467,782	44,725,977	——	——	44,725,977	59,193,759
1918 “ ‘ “	13,364,229	39,398,056	——	——	39,398,056	52,762,285
1919 “ “ “	14,139,619	39,373,452	20,451	——	39,393,903	53,533,522
1920 “ “ “	14,540,474	36,192,621	504,432	——	36,697,053	51,237,527
1921 “ “ “	13,974,490	33,244,477	2,487,730	——	35,732,207	49,706,697
1922 “ “ “	13,316,094	32,184,135	5,010,900	63,959	37,258,994	50,575,088
1923 “ “ “	13,795,114	30,277,855	9,511,305	465,391	40,254,551	54,049,665
1924 “ “ “	14,747,699	28,152,492	12,197,587	890,901	41,240,980	55,988,679
1925 “ “ “	14,836,656	24,880,686	13,271,296	2,472,456	40,624,438	55,461,094
1926 “ “ “	15,104,778	23,653,994	14,419,209	4,717,900	42,791,103	57,895,881

RAPID TRANSIT LINES

Elevated, Main Line, Sullivan Sq., to Dudley St.
Started June 10, 1901
Elevated, Atlantic Ave. Started Aug. 22, 1901
Washington St. Tunnel Opened Nov. 30, 1908
Elevated, Main Line
Extended to Forest Hills, Nov. 22, 1909
Cambridge Subway Opened Mar. 23, 1912
Cambridge-Dorchester Tunnel to Broadway Station Opened Dec. 15 1917
Cambridge-Dorchester Tunnel
Extended to Andrew Sta., June 29, 1918
Elevated, Main Line
Extended to Everett Sta., March 15, 1919
East Boston Tunnel changed to Rapid Transit Operation, April 21, 1924

SURFACE CAR LINES

Tremont St. Subway, Church St. to Park St.
Opened Sept. 1, 1897
Tremont St. Subway, Pleasant St. to Park St.
Opened Oct. 1, 1897
Tremont St. Subway, Park St. to North Sta.
Opened Sept. 3, 1898
Tremont St. Subway, Pleasant St. to North Station, used for rapid transit, June 10, 1901, to Nov. 30, 1908
East Boston Tunnel Opened Dec. 30, 1904
East Cambridge Viaduct Opened June 1, 1912
Boylston St. Subway Opened Oct. 3, 1914

Mail Car Operation discontinued Aug. 14, 1915.

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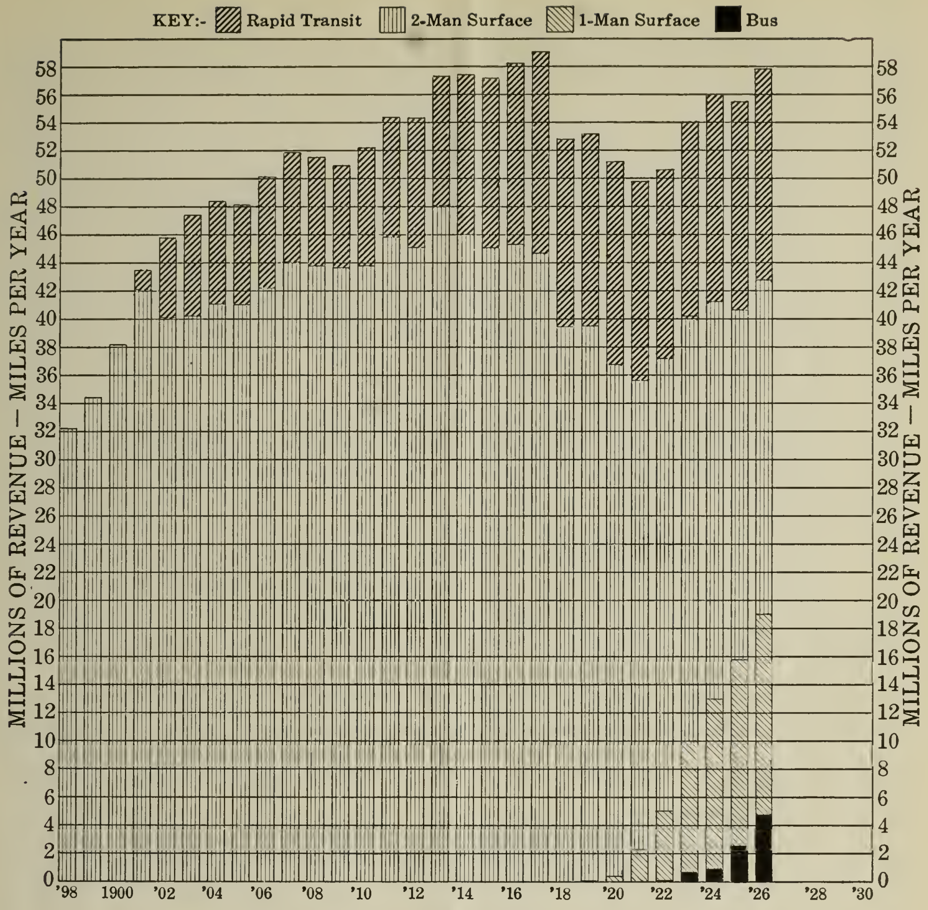
*In the chart these partial figures have been increased proportionately to correspond to a full fiscal year.



REVENUE-MILEAGE FOR FOUR KINDS OF SERVICE

REAL CO-OPERATION

During the afternoon of Friday, July 22, a Div. 4 operator, inbound on Highland avenue, had his car scraped on the left side by a truck going in the opposite direction. The truck driver ignored the fact that he had damaged the car, but the operator, noting that passengers in the car had been showered with glass, commandeered an automobile going in the same direction as the truck, overtook the truck at Cedar street and secured the names of owner and driver.

This took several minutes and two inbound Lechmere cars were delayed in consequence. The operator on the first of these cars, with an eye to the service, transferred his passengers to the car behind him, took on the passengers from the car which had been in collision with the truck, pulled the disabled car over a nearby crossover to the outbound "rail" and, after taking the names of all passengers on the car which had been in collision, continued to Sullivan square instead of Lechmere, his original destination. The result was that he cleared the "rail" and maintained service to Sullivan square.

Such handling of an emergency situation in a way to maintain normal service is highly commendable and is in line with the co-operative spirit that is necessary in making public-utility service successful and satisfactory.

MORE BACK COPIES WANTED

The request, in the issue of "Co-operation" for May, 1927, for extra copies of the March, 1927, issue, brought an excellent response, which is appreciated. Most of the issues for 1926 are very low and copies of any issues for 1926 can be used to advantage, especially those for February, August, October and November.

COMPARATIVE DIVISION OF RECEIPTS AND EXPENDITURES FOR THE YEARS ENDING JUNE 30

(See Chart page 125)

	1927	1926	1925	1924	1923	1922	1921
Total Receipts	$35,618,066.06	$35,087,845.89	$34,198,250.91	$34,262,009.46	$33,612,335.20	$32,698,965.01	$34,200,286.03
Operating Expenses							
Wages	17,108,189.09	17,534,387.50	17,108,826.50	17,218,039.47	15,024,348.04	14,920,406.05	16,753,667.74
Material, supplies and other items	3,422,294.20	3,349,367.41	3,164,261.04	3,165,430.27	3,149,687.89	3,056,520.80	2,899,983.94
Injuries and Damages	1,200,313.79	760,440.65	649,131.12	789,098.53	700,740.79	476,844.02	627,629.02
Depreciation	2,970,707.64	2,533,773.15	2,496,000.00	2,250,000.00	2,004,000.00	2,004,000.00	2,004,000.00
Fuel	1,133,423.85	1,128,464.98	1,188,199.60	1,587,089.27	2,027,712.50	1,656,012.89	2,399,277.71
Total Operating Expenses	$25,834,928.57	$25,306,433.69	$24,606,418.26	$25,009,657.54	$22,906,489.22	$22,113,783.76	$24,684,558.41
Taxes	1,902,525.06	1,819,905.37	1,623,666.39	1,603,269.38	1,722,707.95	1,610,096.47	1,306,736.39
Rent of Leased Rds. (inc. div.)	3,155,110.88	3,165,449.57	3,173,836.74	3,182,020.41	3,186,048.02	4,155,997.46	4,196,533.56
Subway and Tunnel Rents	2,218,137.21	2,214,613.95	2,189,966.39	2,060,337.09	2,025,263.33	1,974,141.07	1,947,963.20
Int. on B. E. Bonds and Notes	2,515,714.25	2,532,590.89	2,576,651.75	2,479,762.27	2,277,051.15	1,483,786.91	1,483,625.54
Miscellaneous Items	68,249.60	58,907.03	58,995.48	71,165.21	65,986.23	58,475.99	54,479.21
Total Cost of Service	$35,694,665.57	$35,097,900.50	$34,229,535.01	$34,406,211.90	$32,183,545.90	$31,396,281.66	$33,673,896.31
Loss or Gain not including Profit and Loss Items	**$76,599.51**	**$10,054.61**	**$31,284.10**	**$144,202.44**	$1,428,789.30	$1,302,683.35	$526,389.75
Profit and **Loss** Delayed Items	$137,259.76	32,359.07	51,865.43	144,202.44	**314,231.48**	82,528.09	23,863.77
Total **Loss** or Gain including Profit and Loss Items	$60,660.25	$22,304.46	$20,581.33	$00.00	$1,114,557.82	$1,385,211.44	$550,253.52

	1920	1919	1918	1917	1915	1910	Sept. 30, 1905	Sept. 30, 1909
Total Receipts	$32,671,515.53	$25,226,981.50	$19,480,022.08	$19,788,953.25	$17,886,549.64	$15,245,865.48	$12,741,569.30	$10,236,994.49
Operating Expenses								
Wages	16,381,206.58	13,554,684.15	9,147,757.25	9,033,868.40	7,709,373.86	5,910,757.73	....	....
Material, supplies and other items	3,321,671.70	4,096,537.98	2,680,423.77	1,951,176.39	1,922,622.52	2,376,033.78	....	....
Injuries and Damages	627,626.48	805,353.09	817,227.18	819,705.54	722,177.00	776,588.37	....	....
Depreciation	2,004,000.00	2,004,000.00	352,670.00	330,000.00	62,989.65	200,000.00	....	....
Fuel	1,996,717.21	1,901.596.75	1,381,957.20	947,412.50	870,820.30	822,497.54	....	....
Total Operating Expenses	$24,331,221.97	$22,362,171.97	$14,380,035.40	$13,082,162.83	$11,287,983.33	$10,085,877.42	$8,617,653.04	**$7,068,110.24
Taxes	1,075,496.70	941,611.50	905,032.96	984,070.55	1,069,189.27	1,213,089.37	1,047,333.72	825,993.04
Rent of Leased Rds. (inc. div.)	4,011,535.96	3,947,349.57	2,905,611.60	3,622,482.28	3,638,655.75	3,030,168.15	1,233,199.43	1,157,130.00
Subway and Tunnel Rents	1,591,323.98	1,491,999.54	991,551.30	995,093.45	825,496.17	559,469.14	228,540.63	211,146.67
Int. on B. E. Bonds and Notes	1,593,257.58	1,423,142.14	1,238,373.55	1,138,655.88	1,049,785.12	556,000.00	779,757.76	498,569.89
Miscellaneous Items	69,284.73	37,372.67	16,050.44	9,525.11	4,587.89			
Total Cost of Service	$32,672,120.92	$30,203,647.39	$20,436,655.25	$19,831,990.10	$17,875,697.53	$15,444,604.08	$11,906,484.58	$9,760,949.84
Loss or Gain not including Profit and Loss Items	**$605.39**	**$5,412,014.35**	....	....	....	....	....	....
Profit and **Loss** Delayed Items	17,685.34	**3,485.78**	....	....	....	....	....	....
Total **Loss** or Gain including Profit and Loss Items	$17,079.95	**$5,415,500.13**	**$956,633.17**	**$43,036.85**	$10,852.11	**$198,738.60**	$835,084.72	**$476,044.65**

† Not reported separately before 1919.

*Includes $435,348.46 back pay applying to May and June, 1919, but paid in October, 1919.

** Includes $240,000.00 to Depreciation Reserve.

OPERATING RECEIPTS AND EXPENDITURES

At the bottom of this page, the data shown in the chart opposite have been reproduced in graphic form. On this graph the separation between operation expenses and overhead is indicated by a connecting line.

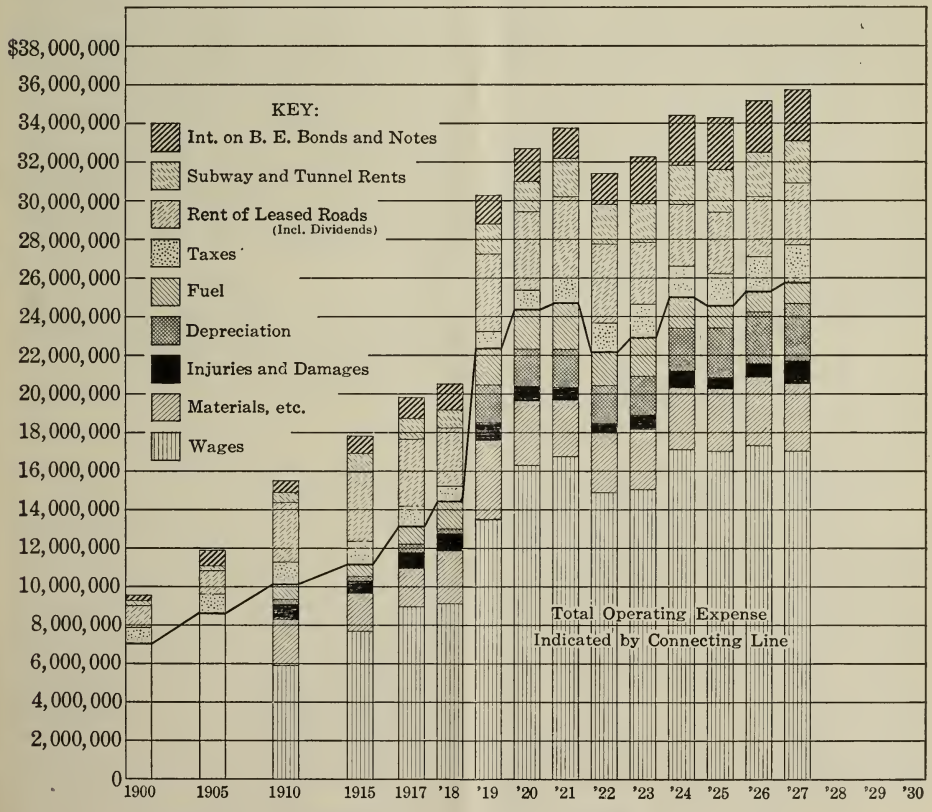
The table on page 124 is a revision of the one appearing in the August, 1926, issue of "Co-operation," page 100. It covers the data up to the end of the fiscal year which closed June 30. The table shows that the revenue for 1927 was $531,220.17 greater than that for 1926, but the operating expenses also increased by $528,494.88. Taxes increased $82,619.69, but there was a slight reduction in the rent of leased roads including dividends. Other items remain substantially the same but the net result, aside from profit and loss items, was a net loss of $76,599.51 for the fiscal year ended June 30, 1927. Fortunately the profit-and-loss credit wiped out the deficit and left a balance of nearly $61,000 which was promptly distributed to the municipalities served by the Railway.

The white bars under the total operating expense for the years 1900 and 1905 indicate that expenses were not subdivided during those years in the same way that they were in later years. Also an irregular horizontal spacing will be noted for the years 1900, 1905, 1910, 1915 and 1917. This indicates that the interval between these bars is not one year as it is from 1917 on.

ASBESTOS

A little paper called "Business Chemistry" recently called attention to the properties of asbestos, which it dubbed "the queerest mineral." It is stone, but it resists erosion; it is mineral, but is non-metallic so that it doesn't rust; it is a fibrous substance that can be woven into cloth, yet it is impervious to fire and water. It is the last known link between the mineral and the vegetable worlds. The ancients regarded it merely as a curiosity, but today it finds almost numberless uses, in covering furnace pipes, insulating walls, shingling roofs, lining brake bands, etc.

You work sixty-nine muscles when you frown, and sixteen when you smile. Don't overwork!—*Commonwealther.*



OPERATING RECEIPTS AND EXPENDITURES AT A GLANCE

EVERYDAY ECONOMICS—I

Short chapters from the novel treatment of this subject by J. E. Le Rossignol, Ph.D., LL.D., Dean of the College of Business Administration, University of Nebraska, in his new book, "First Economics." Special arrangements have been made with the publishers for the reproduction of any or all of this book by the Boston Elevated Railway.*

Income

INCOME is what people receive, in the form of goods and services in a given time, say a year. It is their living, plus what they save, if they have any surplus at all over living expenses.

Usually we speak of income in terms of money, and say that Smith has an income of $1,000 a year; Jones, $5,000, and Robinson, $10,000, as the case may be. But, as they do not consume money, their real income consists of food, clothing, shelter and all the other necessaries, comforts and luxuries of life.

Real income, then, is a sort of stream or flow of things and services, or, to be more exact, of material services and personal services. When we buy food and clothing we have an income of material services or uses; when we spend our money for a concert, a play, or medical aid, we receive the personal services of musicians, actors or doctors.

Primitive peoples, living by hunting and fishing, have practically no money income at all, and very little real income. The yearly income of an Eskimo family, for example, consists of fishes, a few seals and walruses, the huts, canoes, clothes and weapons which they make during the year, plus the personal services which they render to themselves and to one another.

The income of pastoral people, like the ancient Jewish patriarchs, consists chiefly of sheep, cattle and various animal products, such as milk, butter, hides and wool.

The income of farmers may include all of these products, together with grains and fruits, products of wood, stone and clay, and usually a number of commodities obtained by trading.

And when we consider the real income of people living in a great commercial center, such as London or New York, we find that it consists of a great variety of things from every part of the world, according to the way in which they spend their money.

Smith, with his income of $1,000 a year, if he has a family to support, probably spends all his money on the necessaries of life, enjoying few luxuries and saving practically nothing.

Jones and Robinson, with $5,000 or $10,000 a year, will have all the necessaries of life and some comforts and luxuries besides. Also, if they be reasonably economical, they will save something every year and soon own considerable property, such as a house or two, a few mortgages, some gilt-edged bonds, and, possibly, some stock in promising companies.

Therefore, the people who have incomes, by virtue of their power to spend, direct the industrial forces of the country into one channel or another.

If they spend all on themselves and their families, food, clothing, houses, furniture, automobiles, and other consumers' goods will be produced for them.

If, on the other hand, they save and invest part of their income, the industrial forces of the country will be directed toward the improvement of the land, the building of railways, factories, machines, and capital goods of every kind. In this way they will provide for their own future and play their part in the industrial development of the country, thus killing two birds with one stone.

Wealth

LIKE income, wealth is measured in terms of money, but money is only a small part of total wealth.

ESTIMATED WEALTH OF THE UNITED STATES, 1922

Form of Wealth	Value
Real property and improvements ..	$176,414,000,000
Live stock	5,807,000,000
Farm implements and machinery	2,604,000,000
Manufacturing machinery, tools, implements	15,783,000,000
Railroads and their equipment	19,950,000,000
Motor vehicles	4,567,000,000
Street railways, public utilities, and so on	15,414,000,000
Agricultural products	5,465,000,000
Manufactured products	28,422,000,000
Imported merchandise	1,548,000,000
Mining products	730,000,000
Clothing, personal adornments, furniture, and so on	39,816,000,000
Gold and silver coin and bullion	4,278,000,000
Total	$320,803,000,000

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*Copyright by A. W. Shaw Company.

A farmer's wealth consists of land, buildings, cattle, machinery, household furniture, crops, money, and all his other tangible property, plus his credits and minus his debts. A farmer worth $10,000 may have less than $100 on deposit in the bank and only a few dollars of actual cash in his purse.

So, also, with city people. A merchant's wealth consists chiefly of merchandise, although he may have a considerable bank account and carry a little money in his pocket.

The wealth of nations, also, consists chiefly of things other than money. On the preceding page is an estimate of the wealth of the United States in the year 1922, according to the *Census*.

Here we see that all the gold and silver coin and bullion in the country in 1922 was valued at about 1.3 per cent of the total national wealth, all the rest being other commodities valued in terms of money. There was, of course, a great deal of paper money, but that has no intrinsic value or commodity value.

Things which have no price, like air, sunshine and rain, are not regarded as wealth, however useful they may be to mankind. They are called free goods, either because they are abundant or because they cannot be appropriated.

In order to be counted as wealth, things must be useful and scarce and capable of being appropriated. If they are useful but very abundant, they will have no price, because people can get them for nothing. If they are scarce but useless, they will have no price, because nobody wants them.

Wealth is derived from income, but it is mostly that part of income which has been saved, kept, or accumulated. Income is a flow or stream of goods and services; wealth is a stock or reservoir of things or material goods. And just as the stream of income may be turned into the reservoir of wealth, so the reservoir may be turned into the stream again.

Capital

WEALTH may be used in either of two ways: for the direct satisfaction of wants, or for the production of more wealth. The former kind of wealth we call consumers' goods; the latter, pro-

For example, a farmer's dwelling house, furniture, clothing and food are consumers' goods; whereas his land, barns, machinery, horses, cattle, crops and all the rest of his productive wealth, are producers' goods or capital.

Of course it is hard to draw a sharp line between consumers' goods and capital, when things are used in both ways. The automobile may be used partly for business, partly for pleasure; the house may be now dwelling, now storehouse; some of the crops may be used at home, though most of them are sold on the market.

But for all that, the distinction between the two uses is fairly clear. At any rate, many a farmer's wife understands it quite well, especially when she wants a new carpet or a dress, when her husband wants to buy more cattle or build a barn.

If the farmer spends all his money on furniture, clothes or automobiles, he will be unable to improve the farm and is likely to run into debt.

If, on the other hand, he spends most of his time and money on farm improvements, he may deprive his family of the comforts and even the necessaries of life. However, in the end he will probably become rich, and have more to spend on comforts and luxuries in later life, if he be so inclined.

Evidently there are two kinds of spending: first, on consumers' goods; second, on producers' goods or capital. Usually we call the former spending, and the latter saving or investing.

As human beings are apt to go to extremes, the spender imperils the future for the sake of present enjoyment, while the saver sacrifices the present to a future which he may never have time or inclination to enjoy.

There is, no doubt, a golden mean between the extremes of spending and saving, though it is safer to err on the side of saving, as that is the only way to create and accumulate capital and thus provide against a rainy day.

There are, also, two kinds of saving: first, the storing up of food, clothing and other consumers' goods for future use; second, the creation of improvements on land, factories, machines and other things to be used for increasing production. It is the latter kind of saving that creates capital, though the former may be closely connected with it.

Our present day is, more than all previous times, the age of capital. We have only to look about to see what a vast stock of capital goods we have: improved land, barns, cattle and horses; factories, railways, ships, telegraph and telephone lines; and tools and machines without end.

With all these appliances and instruments, together with our business organization, our banks, insurance companies and other financial institutions, we are able to produce vastly more of the necessaries, comforts and luxuries of life than ever before.

The result is that our unskilled laborers have comforts of which middle-class people of 200 years ago did not even dream, while people of moderate income today live in greater luxury than the nobles and princes of those days.

CHANGES IN THE RESERVE FUND

Fiscal Year 1926-27
July 1, 1926, $1,000,000

July	$393,028.41*	Jan.	$186,947.50†
Aug.	451,546.79*	Feb.	92,018.37†
Sept.	236,543.80*	Mar.	256,586.83†
Oct.	2,723.19†	April	181,694 29†
Nov.	29,302.22†	May	113,284.72†
Dec.	234.879.91†	June	92,917.54*

Profit and loss credit..... ..$137,259.76

Fiscal Year 1927-28
July 1, 1927, $1,000,000

July $353,208.21*

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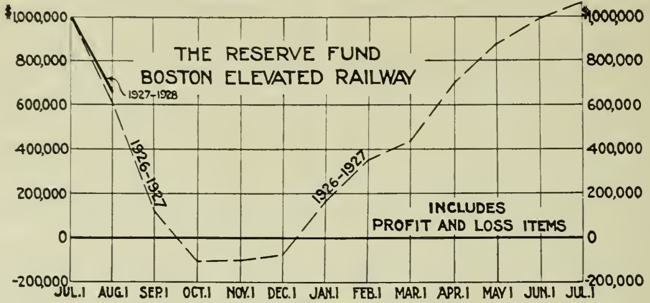
†Excess of revenue over cost of service.

*Excess of cost of service over revenue



JULY OPERATION

GENERAL FINANCIAL DATA	1927	1926
Cost of service exceeded revenue	$353,208.21	$393,028.41
Operating revenue per car-hour (A.E.R.A. std.)	$5.51	$5.23
Operating revenue per car-mile operated	55.85c	54.24c
Average fare per revenue passenger	9.259c	9.284c
Ratio operating expense to operating revenue	81.70%	83.95%
PASSENGERS CARRIED		
Revenue passengers	26,167,466	27,160,300
Per cent 5c, 6c and 6¼c passengers	18.60%	17.39%
Revenue passengers per car-mile operated	5.826	5.647
OPERATING FACTS		
Trips operated	581,085	630,054
Car-miles operated:		
Rapid-transit lines	1,152,950	1,186,783
Surface, two-man	1,637,926	1,965,154
Surface, one-man	1,234,026	1,238,162
Express, newspaper and sprinkler cars	890	2,345
Motor bus	465,875	417,165
Total miles operated	4,491,667	4,809,609
ACCIDENT DATA		
Accidents per 10,000 car-miles	1.97*	2.04*
Accidents per 10,000 bus-miles	2.36*	2.5*
Revenue passengers carried per reported accident	17,910	16,180
Average number of witnesses per accident	3.64	3.16
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	7	6
Employees complained of by car riders	91	78
Car defects reported per 10,000 car-miles	3.6	3.7
INFORMATION ABOUT POWER		
D.c. kw.-hr. output gross per month	15,639,500	16,726,380
Maximum kw. load	54,280	54,920
Tons of coal consumed for power	14,021	15,443
Lbs. of coal for power per d.c. kw.-hr. at cars	2.013	2.083
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	1.14c	1.18c
Per revenue car-mile	4.01c	4.11c
Kw.-hr. per revenue car-mile	3.14	3.49

*This does not include miscellaneous accidents or derailments.

August 20, 1927. EDWARD DANA, *General Manager.*

BOSTON ELEVATED RAILWAY
CO-OPERATION

Volume 6 SEPTEMBER, 1927 Number 9

Boston Elevated Close-Ups

THE CARPENTER

(See Page 139)

To All 'El' Employees

IT is appropriate that the message to you this month should relate to accident prevention. Its purpose is to request your sustained co-operation in the systematic effort which is being made to assist you in making the Railway increasingly safer. Travel on the streets is becoming potentially more dangerous. By that I mean that the chance of accident is greater as the street congestion increases. We must cope with the situation.

Every man naturally abhors being involved in an accident. The bravest man shrinks instinctively from causing suffering, and to a lesser extent he dislikes being the cause of damage to property. This is what makes a man inherently a safe operator, or whatever else his task may be. All accidents are, therefore, inadvertent, that is, unintentional.

At the same time a man who is always fearful of causing an accident is not in a safe state of mind. Self-confidence in one's ability to avoid accidents, of course backed up with real skill, is the best safeguard.

It is better to concentrate on safety than on accidents.

Edward Dana

HANDLING AND DISPATCHING SUPPLIES AND EQUIPMENT IN THE MAINTENANCE DEPARTMENT

The Maintenance Department Yard at George Street, Charlestown, Is an Important Part of the "Machinery" Used by the Boston Elevated Railway to Insure Efficiency in Construction and Maintenance Work

SAND IS DRIED IN THIS PLANT

THE railway property at Charlestown has been used for the storing and dispatching of material for the Rapid-Transit Lines since 1900. When the Everett Shops were built the carload freight assigned to the department of rolling-stock and shops was transferred to Everett. The Charlestown power station is now used principally as a substation and the coal storage area formerly necessary is therefore no longer required.

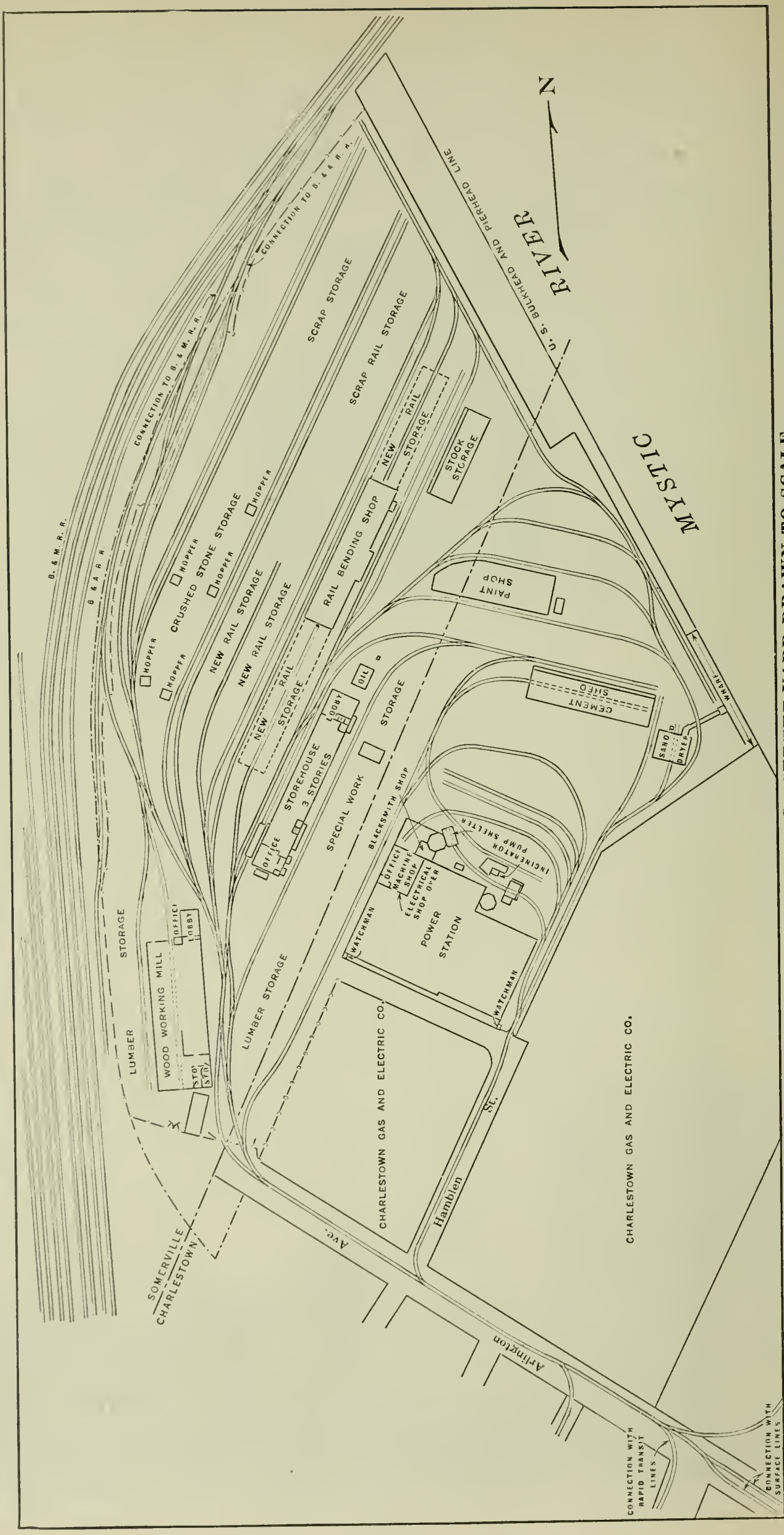
The East Cambridge power station property was purchased by the Boston & Maine Railroad in 1921 and part payment was made by deeding to the Boston Elevated Railway land owned by the Boston & Maine Railroad adjacent to the Boston Elevated Railway property at Charlestown. These changes increased the area available for storage purposes to 17.34 acres and enabled the Railway to consolidate the surface-lines maintenance-department yard and storehouse then located at First Street, South Boston, with the rapid-transit yards and storehouse at George Street in December, 1926. This consolidation resulted in a considerable increase in efficiency and a large annual saving.

A new division of the maintenance department was created and placed in charge of a supervisor of yards and stores. This official is also responsible for the receipt, treatment and shipping of ties and heavy lumber used in track construction, both by the surface and rapid-transit lines.

Large as the area is at George Street, it is not of sufficient size to allow the tie-treating plant, located at South Boston, to be transferred to George Street.

George Street yard has connections with two steam railroads, and a wharf is located on the Mystic River for the receipt of water-borne freight. There are 3.29 miles of track in the yard connecting with both the surface and rapid-transit lines.

CRANES HANDLING CRUSHED STONE AND RAILS OUT OF STORAGE



LAYOUT OF THE GEORGE STREET YARD DRAWN TO SCALE

Entrance to the yard is made from Arlington Avenue or George Street, for both cars and trucks. Here is located a modern, reinforced concrete, fireproof storehouse building, consisting of three stories with a waterproof basement, having a total floor area of 35,506 square feet. All furniture, storage bins, stock bins, etc., are of steel and all fittings are absolutely fireproof. On the lower floor at the rear end a large room is provided for lockers and toilet.

A truck scale and a car scale are alongside the storehouse, where all material requiring is weighed into and out of the yard, the beam in each case being located directly in the office.

This building was erected in 1923, immediately following the fire which destroyed the 2½-story wooden building which had been in use for some years.

A shop, having a floor area of 8,400 square feet and equipped with modern machinery for fabricating all rails used by the surface and rapid-transit lines, is conveniently located with reference to the trackage and is provided with a craneway on either end, so that material entering the shop is handled by an overhead crane and passes through the shop out of the other end and is there loaded directly onto the cars.

A well-equipped wood-working shop is also located in the yard near Arlington Avenue, where material required by the maintenance department is produced.

On a part of the lower floor of the power station is located an efficient machine shop for maintenance-department work only, and directly overhead is a shop for the inspection and repair of signal apparatus, industrial motors and electrical apparatus used by the maintenance department. The equipment used by the department is overhauled and repaired at this point, the equipment on car wheels reaching the shop by way of a special track reserved for this purpose.

A building for the storage of painting equipment and materials is located in another part of the yard and in this building signs and other articles are painted.

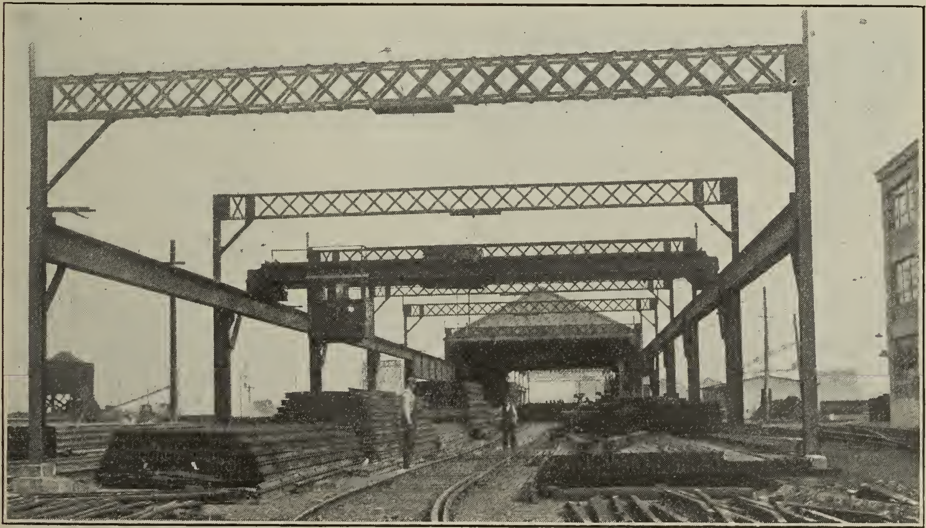
Near the wharf a sand-receiving and drying plant is located, having a capacity of 950 tons of wet sand and 650 tons of dry sand. All of the sand used by the Railway for any purpose is received at this wharf directly from barges used to dredge the sand from the sea bottom. The sand is unloaded at the wharf by hoisting apparatus on the barge and is handled by automotive machinery so that it reaches its destination without handling by human hands.

A large shed for the storage of cement and other similar material, equipped with tracks for unloading directly from the freight cars, is conveniently located in the vicinity of the sand plant.

Oil and other inflammable liquids are stored in a separate concrete, fireproof building.

At the time of the consolidation of the yards a shed with a floor at the height of freight car floors, having an area of 5,000 sq. ft., was erected for the storage of joints, tie-plates, tie-rods and similar material, this material being unloaded directly from the freight cars into the shed.

An area is provided for from 7,000 to 10,000 tons of crushed stone which is kept at this yard as an insurance against



RAIL STORAGE WITH FABRICATING SHOP IN BACKGROUND

BUILDINGS AT GEORGE STREET YARD

1. Rail-bending shop, with paint shop (right) and roof of cement shed (left) in foreground. 2. Paint shop in foreground, with storage shed (right) and rail-bending shop (left) in background. 3. Carpenter shop and wood-working mill. 4. Main storehouse.

the non-receipt of this material from contractors during the busy season.

Alongside the storage pile are permanently erected several elevated bins holding approximately 225 tons so that dump cars may be quickly loaded without delay.

The areas for the storage of material, together with the layout of the tracks, have been carefully arranged so that freight may be unloaded directly into several buildings and at outdoor storage spaces, and at the same time a considerable number of cars or trucks may be loaded and dispatched without interference one with another.

The yard is well equipped with apparatus for quick loading and unloading, in addition to the overhead crane at the rail-bending shop. There are three locomotive cranes, having a capacity of 15 tons each, one electric locomotive and several combination motor and trolley cars used on the rapid transit lines at night, which are also used in the daytime for shifting freight cars and the Boston Elevated Railway flat cars. All of the locomotive cranes are equipped with buckets for handling crushed stone and similar material with special hooks, etc., for handling heavy loads and also with electric magnets for loading and unloading rail, particularly scrap rail.

All scrap material belonging to the maintenance department is received at this yard; such part of it as can again be used is reclaimed, and the balance sorted into the different kinds of material for ready sale.

A large area is reserved, between parallel tracks, for the storage of from 5,000 to 7,000 tons of rail. This rail is quickly and efficiently handled from these tracks alongside the various rail piles by the crane cars or by the specially equipped rail cars.

All of the rubbish collected from the rapid-transit stations and carhouses has to be disposed of in some manner. Up to recent date this material was used for filling in flat lands at George Street, but when this space was no longer available, it became necessary to dispose of this material in some other manner. Advantage was taken of the fact that the large stack for the power station is not in use and an incinerator was built along the side of the stack with a concrete platform and wire-enclosed bottom of large size, with a track leading to the platform so that material brought in by cars can be unloaded expeditiously and the material disposed of by burning.

The yard, as well as all the buildings, is provided with fire-alarm boxes and and adequate system of fire protection is provided with hose houses at suitable intervals.

The book value of the George Street yard plant is about $1,000,000. There are approximately 14,000 kinds of material kept in the storehouse or yard, this material having a value, as of December 31, 1926, of $866,896.

The yard is operated by a force of approximately 100 men under the direction of the supervisor of yards and stores, he being assisted by the storekeeper, the yardmaster and various foremen.

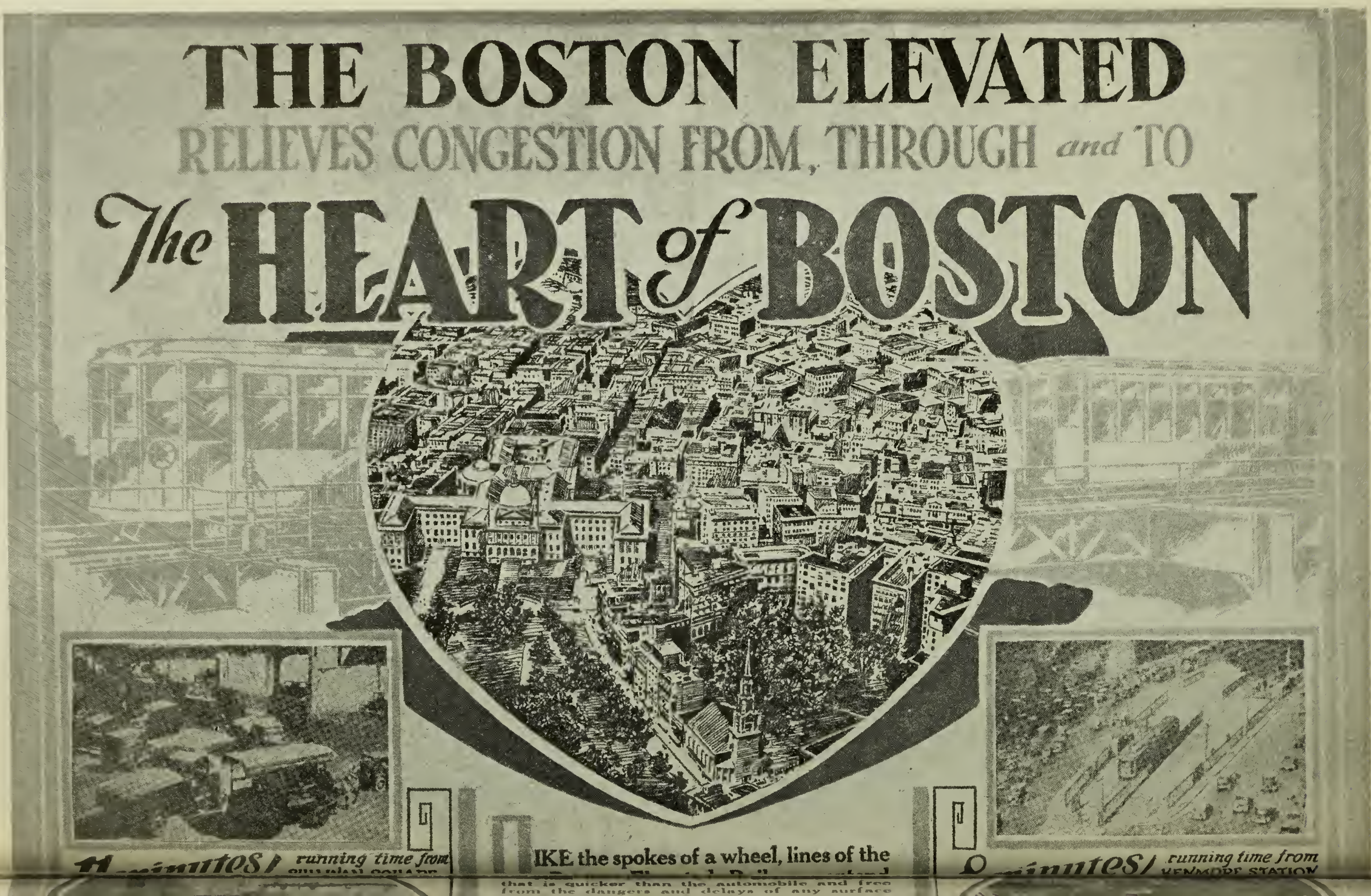
SOME INTERESTING DATA

From May 1 to December 31, 1926, 378 carloads of freight, or 12,796 tons of miscellaneous material, was received at George Street, in addition to 3,000 tons of rail previously received. During this period 221 carloads, or 5,064 tons of ma-

(Please turn to page 143)

MAIN STOREHOUSE WITH RAPID-TRANSIT WORK TRAIN AT LOADING PLATFORM

THIS FULL-PAGE NEWSPAPER ADVERTISEMENT GIVES CONVINCING TESTIMONY AS TO THE SPEED OF "EL" RAPID-TRANSIT SERVICE



THE BOSTON ELEVATED

RELIEVES CONGESTION FROM, THROUGH *and* TO

The HEART *of* BOSTON

minutes! running time from

LIKE the spokes of a wheel, lines of the

that is quicker than the automobile and free from the dangers and delays of any surface

minutes! running time from KENMORE STATION

7 minutes! *running time from* ANDREW SQUARE *to the* HEART of BOSTON

The PROBLEM

Traffic tangles, waste motion, a slowing up of the arteries of trade, hazards of injury, parking difficulties, these are the perplexing problems of increasing congestion in the heart of Boston.

Within a certain radius, roughly the area circled by the terminals shown on this page, traffic is complicated and congested. The automobilist who attempts to travel in or through this area only contributes to the general congestion which finally involves his own car.

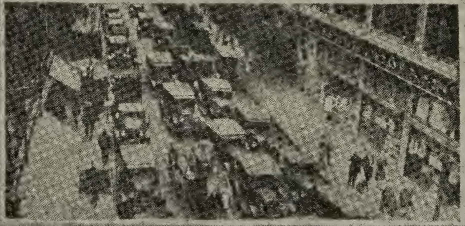
How can the strain and expense of driving through Boston's busiest streets be avoided, and what are automobilists to do with their machines when on a shopping trip or a business visit in the traffic areas?

that is quicker than the automobile and free from the dangers and delays of any surface vehicle through heavy traffic.

The Elevated is as much a boon to the automobilist as to the suburban street car commuter.

It carries you straight through the maze of traffic, safely, quickly, economically. It gets you to work, carries you to the shopping district, and brings you safely back home. Elaborate safety devices, among the most costly of any city, protect you during every second of your ride.

Examine these pictures, actual Boston scenes, see how the Elevated can assist the automobilist. See how you can use the Elevated lines and save time for yourself while you lessen the traffic burden.



Progress through traffic in central Boston is uncertain and slow. You lose time whenever you ride in the press of congestion. *Don't do it —take the Elevated.*

8 minutes! *running time from* HARVARD SQUARE *to the* HEART of BOSTON

The SOLUTION

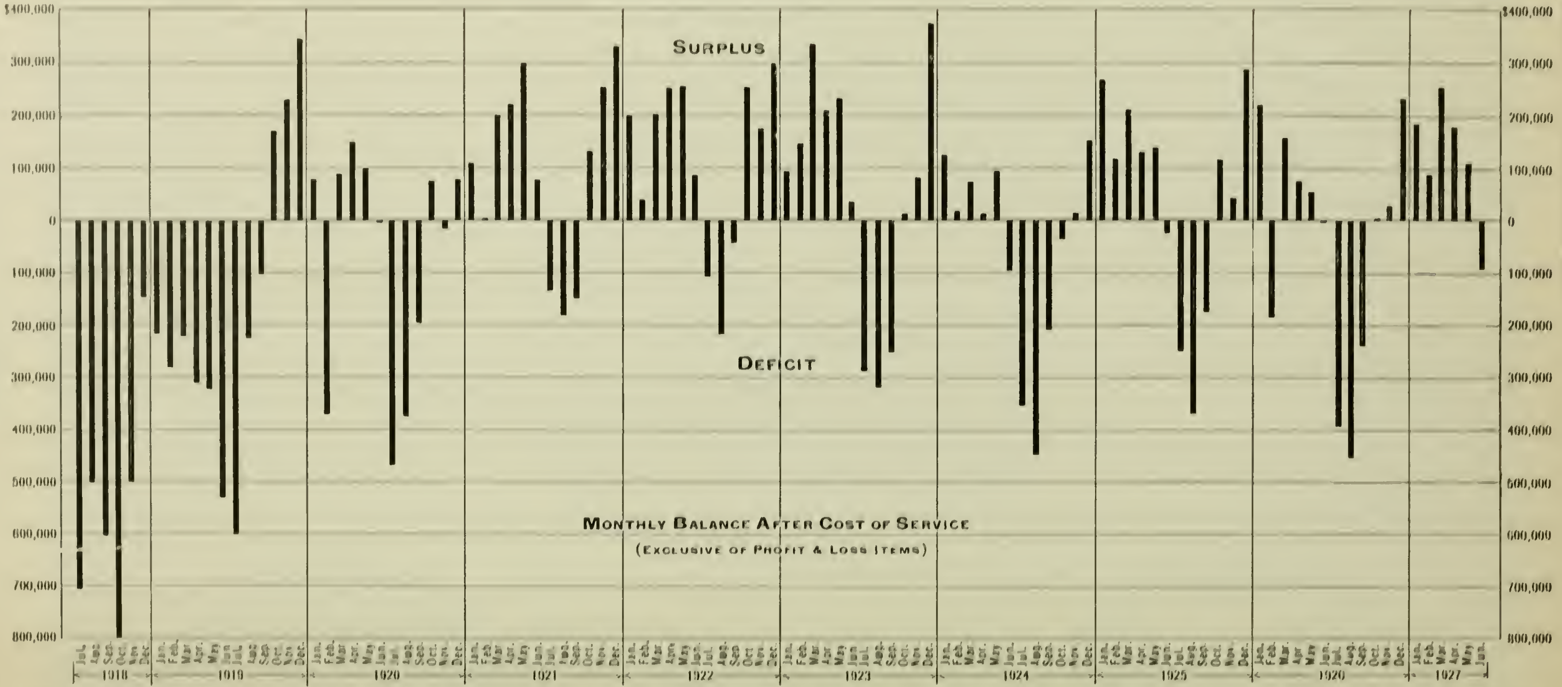
Driving through Boston's busiest traffic should be avoided by all whose needs could be satisfied as well or better by the Elevated.

This does not mean giving up the automobile as a means of transportation to and from the city.

Elevated terminals are located at points where heavy traffic begins. Those are the points where your automobile should stop. Drive to these points, park your car at a slight cost and *take the El into town.* In this way you are relieved of the expense and strain of driving through the heart of Boston, you have no parking problem, no danger. You save time and money and you help to make Boston a more efficient city.

8/14/27

The BOSTON ELEVATED RAILWAY COMPANY BOSTON'S PUBLIC SERVANT *for* THIRTY YEARS



THIS CHART GIVES A PERSPECTIVE VIEW OF THE NET FINANCIAL RESULT OF OPERATION MONTH BY MONTH SINCE THE BEGINNING OF TRUSTEE CONTROL

ELEVATED CLOSE-UPS

The Carpenter

(See Illustration on Front Cover)

THE front-cover picture this month shows a carpenter engaged in making repairs on the vestibule roof of a No. 5 semi-convertible car which had been damaged in a collision. The damaged roof and framing, having been previously cut away, are now being rebuilt. The picture shows the new header and carlines in position, and the workman is installing the new supports, after which the roof sheathing will be nailed in place and a coat of lead paint applied. Then the canvas will be drawn tightly in place and tacked at the edge.

The work of the carpenter shown consists largely in fitting and applying the pieces of wood which have been milled in the mill room from sample pieces that were retained when the roof was cut away.

The mill room is directly connected with the carpenter's work, for it is here that various wooden parts of the car are first formed. In this room, at the Everett shops, there are nineteen of the most up-to-date direct-motor-driven woodworking machines and seven older-type maches which have been changed over to direct motor drive, including the mortiser, molder, tenoner, double-spindle shaper, lathe, planers, band saws, circular saws and sanding machines.

Some of the items manufactured in the year 1926 for the maintenance of our cars were:

Car doors of all types	3482
Car sash of all types	3860
Car lifeguards	5169
Conductors' and Motormen's seats	933
Brakeshoe headblocks	2675
Motor-lead junction boxes	1743
Shoe beams, R.T.L. cars	439

During 1926, 805 passenger cars and 109 buses were given general repairs. Two hundred and eighteen cars and seventy-one buses, involved in collisions of one kind or another, were repaired.

The carpenters and mill men at these shops not only make repairs on cars, but are called upon to manufacture many items used on the Railway by other departments, such as turnstile arms, third-rail insulator bushings, oak crossarms, spreader poles, switch boxes, Cheatham switch-pan parts, etc. There are numerous chairs and other pieces of office furniture which are repaired.

SURPLUSES AND DEFICITS

Under the law, the Boston Elevated Railway must balance its budget every year. The deficits of the lean months must be offset by profits during the remainder of the year. As shown clearly in the chart on page 138, which is a revision of the one appearing on page 86 of the July, 1926, issue of "Co-operation," the lean months are normally July, August and September. In August the deficit is greatest, sometimes passing $450,000. That is the month of vacations and of good weather for the automobile. The schools are closed, even the summer sessions being concluded during the month.

This year the August deficit (not shown on the chart), was $408,570.65 (see page 144). As compared with last year it was nearly $43,000 less. In July, 1927 (also not shown on the chart), the deficit was $353,208.21, which was $39,820.20 less than that for July, 1926. (See page 128 of last month's issue.)

This chart is reproduced to furnish a graphic picture of the Railway's operating record from the financial standpoint. It will repay careful study by every employee.

Reprove thy friend privately; commend him publicly.—*Solon.*

WATCH THE DUMP

"Practically every bit of material that any concern receives is checked in and has an invoice attached," says R. P. Warner, writing in *System*. "In due time it has to be paid for—hence practically all that later goes out by way of the ash heap, or dump barrel, has originally cost the business money. And of course it is a simple truth that the closer this waste can be watched, and the more it can be reduced by use in manufacturing, or by the sale of by-products, the more we can increase profits."

With the help of the industrial chemist, more than one business is now paying its dividends out of what used to be waste materials, and many others have developed very profitable side lines and indeed even major lines, from what were at one time considered almost worthless by-products.—*Business Chemistry.*

THIRTY YEARS AGO

Hundreds of employees of the railway have been in its service, or have been residents of this community, long enough to remember the opening of the Tremont Street Subway from Church street to Park street, on Sept. 1, 1897. It will not be many years now until the sinking fund provided out of the carfares will reimburse the city for the cost of this subway.

EVERYDAY ECONOMICS—II

In these short, unusually readable articles J. E. LeRossignol, Ph. D., LL.D., Dean of the College of Business Administration, University of Nebraska, touches upon certain phases of our everyday economic life. We are fortunate in having the opportunity to obtain this information in such attractive form.

PROPERTY

Property is income or wealth regarded from the legal aspect, or the lawyer's point of view. It is income or wealth which belongs to a person, to which he has a claim or right which the state will recognize or protect.

Property may belong to private persons or corporations or to the Federal Government, the states, or other public bodies.

There are two main classes of property: personal property or movables, and real estate or immobile property. Real estate consists chiefly of lands and buildings, but may include also fences, drains, irrigation works, roads, railways, canals and other permanent improvements.

Personal property consists of cattle, machinery and tools, furniture, vehicles, raw materials, money and all other chattels or movables.

Personal property includes also stocks and bonds, debts and credits, franchises, good-will of business, and other so-called intangible or invisible property. Such property is called intangible or invisible because it is hard for the public authorities to find it for purposes of taxation. But it is tangible and visible enough to the owners and creditors concerned, and is an important part of individual wealth.

However, such items are not included in a list of a country's total wealth, as for every creditor there is a debtor, and all the credits and debts, the pluses and minuses, cancel one another in the total sum of national wealth.

Property is an institution so ancient that, as the lawyers say, "the memory of man goeth not to the contrary."

Personal property has probably existed since man was man, for the so-called "acquisitive instinct" seems to be deeply rooted in human nature. At any rate, most primitive peoples recognize private property in food, clothing, weapons, animals and other movables. Even stories, songs and magic formulas are regarded by some so-called savages as the private property of the authors, almost like our modern copyright.

The origin of private property in land is more debatable, but that also is a very ancient institution, though modified from time to time and often from place to place, according to circumstances.

Like everything human, the institution of private property has its shady side, yet it is one of the foundation stones of civilization, and is intimately, if not inseparably, connected with freedom of contract and family life. This is largely due to the fact that the private owner has a greater interest in the improvement and management of his property than any public authority.

But private owners have always been subject to more or less of public control in the interest of other owners and of society at large. Also, wealthy people are regarding themselves more and more as stewards or trustees, holding and using their wealth for the general good.

ECONOMIC EVOLUTION

One of the most striking, though familiar, facts of human life is the change that is continually going on, from which we may infer that things were very different in the past from what they are today, and that they will change much in time to come. If Captain John Smith could return to England and America, he would hardly know those countries. And if we could come back to earth 300 years hence, we should see tremendous changes in places, people, and ways of life.

Historians say that man has passed through five or six fairly well marked steps or stages in his advance from savagery to civilization. These are usually called the stage of direct appropriation, the pastoral, agricultural, handicraft and industrial stages.

The earlier part of the stage of direct appropriation is called the collecting stage, when man picked up his living as best he could with his unaided hands.

Later on, man began to use tools and weapons of wood, bone and stone, and, gradually, invented the spear, the trap, the net, the fish-hook, the bow and arrow, the canoe; learned to make fire and to cook; and was able to obtain a fairly regular living by hunting and fishing.

After this, in order of development,

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came the pastoral stage, as men found that they could obtain a more abundant and regular supply of meat, milk, hides and wool by keeping flocks and herds than by hunting, especially where game was scarce. So gradually, various animals were domesticated, such as the sheep, the cow, the goat, the camel, the reindeer and the llama. Then, too, they used those and other animals as beasts of burden, such as the dog, the ass, the horse and the elephant.

Strange to say, the North American Indians, before the Europeans came, had no domestic animals but the dog, although there were buffalo on the great plains and wild sheep and goats in the Rocky Mountains.

The agricultural stage came next in order of civilization, as farmers raised grains and fruits as well as domestic animals. Also, they had vegetable fibers, such as flax, for clothing; had permanent dwellings; engaged in commerce, and laid the foundations of civilized life. Such were the ancient Israelites, after they left their nomadic life in the wilderness and settled in the Promised Land.

The handicrafts began in the hunting and fishing stage, but were not fully developed until the later agricultural stages, as men perfected the arts of pottery, spinning and weaving, wood and metal working, building, and the like. Then everything was made by hand, with the aid of tools and simple machines, and much of the work was done by slaves.

During this time cities arose, exchange or commerce developed, and ancient civilization reached its height. To this stage belong the great cities and empires of ancient times, such as Babylon, Ninevah, Egypt, Athens and Rome.

After the downfall of the Roman Empire, in the fifth century, A. D., civilization in western Europe declined, and did not regain its former position for a thousand years.

But, gradually, the ancient arts and crafts revived or were rediscovered, and Europe was again at a high point in the handicraft and commercial stage toward the end of the eighteenth century, when the new machines were invented and the modern industrial stage was ushered in by the Industrial Revolution.

THE INDUSTRIAL REVOLUTION

The word manufacture is derived from two Latin words (*manu, facere*), meaning "to make by hand." In former times, then, the manufacturer was a craftsman or artisan, often a poor weaver, tailor, or shoemaker, working at home with the help of his wife and children.

In those days a manufactory was no great establishment buzzing with machinery, but merely a shop, large or small, where people worked with tools or simple machines run by hand or foot, though sometimes by windmill, water-wheel, or treadmill.

In the third quarter of the eighteenth century, and even later, spinning was done with the old-fashioned spinning wheel; weaving with a hand-loom; lumber was cut with ax and hand-saw; by land people traveled on horseback or by stage coach; by sea they went in sailing vessels or in galleys propelled by oars; and, in general, industry was carried on much as in ancient times.

Then occurred a remarkable series of inventions, especially in the manufacture of cotton, which, in a few years, made a greater change in industrial life than had taken place in thousands of years before, and which has very properly been called the Industrial Revolution.

The earliest of these was Kay's "flying shuttle" (1738), which increased the speed of weaving so much that it was hard for the spinners to keep up with it. Later, spinning was much improved by Hargreave's "spinning jenny" (1764), Arkwright's "water frame" (1768), and Crompton's "mule" (1779), a combination of both.

After this the weavers could hardly keep pace with the output of yarn from the new spinning machines; but presently the balance was restored by the invention of Cartwright's "power loom" (1785), while the supply of raw cotton was greatly increased as the result of the invention of the "cotton gin" by Eli Whitney (1793).

Many other inventions have played their part in revolutionizing one industry after another from that day to this. Among them are Watt and Boulton's steam engine (1785), Fulton's steamboat (1807), Stephenson's locomotive (1825), Naismyth's steam hammer (1839), Howe's sewing machine (1846), the electric telegraph, the telephone, the typewriter, the Bessemer process, the oil motor, the gasoline motor, the automobile, the airplane, and a host of improved tools, machines and methods in agriculture, mining, transportation and every other industry.

Some idea of the work done by modern machinery can be had from the fact that, in the year 1924, the railways of the United States carried freight equivalent to more than 450,000,000,000 ton-miles, being an average of about 4,000 tons carried one mile for every inhabitant, or more than 10 tons per person per day. Not all the men and horses in the country could do this work in the old-fashioned way.

By such means the output of industry has been enormously increased, and, although such rapid change has involved hardship to displaced laborers, in the end all classes have greatly benefited by having more of the necessaries, comforts and luxuries of life.

The Industrial Revolution, then, was the transition from the handicraft to the industrial stage of economic evolution, in which most of the work of the western world is done by machines.

EDUCATIONAL COMMITTEE PLANS INTERESTING PROGRAM

The committee for this year comprises Edwin M. Brooks (legal), Francis W. Casey (claims), James Donohue (power), Jos. D. Donovan (audit), Wilmot M. Evans (purchasing), Jos. A. Griffin (transportation), Rudolph Kundert (rolling-stock and shops), E. R. Peters (treasury), Maj. A. G. Reynolds (maintenance), Miss A. J. Walsh (audit). Miss Walsh represents the interests of the women employees particularly.

THE above committee, appointed by Mr. Dana last spring to prepare an educational program for the coming season, has submitted the details of recommended courses and these have had the approval of the management. A prospectus of the courses has been prepared for each employee. Extra copies are in the hands of committee members or can be secured from the educational advisor. The program begins Nov. 1, and registration forms should be handed in promptly. A digest of some features of the courses is given below:

Supervised Reading. There will be only one course this year, on contemporary American literature, under the direction of one of the most popular instructors at Boston University.

Foreman Conferences. The men in supervisory positions who have completed courses during the past two years will be invited to join advanced groups. First-year groups will also be arranged for those who have not completed courses. Thus there will be 1st-year, 2nd-year and 3rd-year groups in the transportation and non-transportation departments.

In addition, members of all groups and men in supervisory positions, but not in any of the groups, will be eligible to join an informal association of supervisors, the first meeting of which is scheduled to be held on Wednesday, Oct. 19, at 7.30 P. M., at Sullivan Square.

Public Speaking. This course, which has been so popular during the past two years, will be continued under the same capable instruction.

Maintaining Automotive Equipment. D. S. McKay has agreed to conduct a conference course, with prominent speakers from outside companies, the plan which was so well liked in Part 2 of last year's course. The talks will largely be illustrated.

History-Making Events of the Day. Prof. G. S. Miller, of Tufts College, with the co-operation of railway officials, will give a series of talks which will relate current events to the everyday life of Boston Elevated employees. This will be the professor's third year on our instructing staff.

Everyday Law. Edwin M. Brooks, of the general counsel staff, will preside at a series of meetings at which the speakers will be well-known lawyers who have the ability to bring the subject down to everyday life. The series is designed to interest every employee, not merely those whose work involves legal matters.

Investing Savings. After a lapse of a year, L. J. Dickey, receiving cashier, has agreed to preside over a series of meetings at which the various ways of conserving and increasing savings will be discussed by experts. The fine course of two years ago, which was abstracted in recent issues of "Co-operation," indicates what is to be expected this year.

Correct English. Miss Grace M. Miller, who conducted a course for women employees two years ago, will conduct one for both men and women this season if the enrollment is sufficient to warrant doing so. She will give a demonstration of her methods about ten days before the course is scheduled to begin.

Personal Efficiency. The general interest in inspirational talks and writings indicates widespread desire for information as to how the individual can best develop his own personality. A course has been arranged in this field to give employees the best available information. The instructor selected is a successful business man who has applied correct fundamentals in his own work.

Women's Interests. In the belief that women employees will appreciate the recreational value of a course in fabric painting, arrangements have been made with the Division of University Extension, Massachusetts Department of Education, for a course in this subject. This will aid in the production of useful and artistic pieces of handiwork. The instructor selected is a woman who is skillful and knows how to interest others.

Departmental Group Conferences. These conferences have demonstrated their value as a permanent feature of the educational program. The leaders this year will be J. A. Griffin (transportation), Rudolph Kundert (shops) and Maj. A. G. Reynolds (maintenance). The program will include both recreational and instructional features.

Psychology of Personality, or Understanding Men and Women. Through the courtesy of the Edison Electric Illuminating Company of Boston, Elevated employees are invited to join in a course on the above subject to be conducted by Prof. Irving C. Whittimore, of the department of psychology, College of Business Administration, Boston University. As this is an unusual opportunity for instruction in this subject the course has been incorporated as part of the Boston Elevated educational program. The course will be given at 6 P. M.

Popular Talks on Health subjects.

Another opportunity offered our employees by the Edison Company is a series of talks on the most common causes of sickness and disease. These will be given by staff members of the Massachusetts General Hospital. The Edison Company is expending a large sum on this course, but offers to receive 'El" employees, to an extent to which Edison employees are not inconvenienced, without charge. It is hoped that a large number of "El" men and women may find it convenient to attend these talks, which will, like those in the above course, be given at 6 P. M.

(Concluded from page 135)

terials, principally scrap, was shipped out by rail. During 1926 more than 29,000 tons of sand was received by barge, about half being dried, as well as nearly 8,000 tons of crushed stone and 3,000 tons of salt.

In one month of active construction work the following items were delivered from the yard:

3,300 tons of sand
3,516 tons of stone
12,589 bags of cement
35,000 feet or 669 tons of rail
3,000 paving brick
53 lots of special trackwork
4,000 pieces of pipe conduit.

In addition, 2,500 feet of rail, 705 ties and 182 pieces of 6-inch by 6-inch guard timber were handled for maintenance work on rapid-transit lines. Of scrap material 1,100 tons was received as well as fifty-six loads of ashes which were spread over the yard.

During the same period 391 tons of track material was shipped out of the South Boston yard, as well as 1,704 ties and 1,775 feet, B. M., of lumber.

MATERIALS DISPATCHING

As efficient and economical handling of materials and supplies at the yard would not be possible without a proper dispatching system, all material, equipment, or transportation for material is handled by a materials dispatcher. Every division of the maintenance department is required to notify the materials dispatcher in the afternoon of the preceding day of its requirements of the material, equipment and cars or trucks for the following day. With this information at hand, the materials dispatcher is able to make a layout, using a minimum number of cars or trucks, for delivering the material required at the time and place specified. Although the materials dispatcher is located at Lenox Street, he is closely in touch with the activities of George Street yard.

As an example of the care and attention that is necessary in the preparation and dispatching of material used in the maintenance department, the following short discription with respect to the rapid-transit lines is indicative of the methods used at the yard:

Six nights each week two trains with crews of men leave Sullivan Square to make repairs to the track, ties, guard timber, etc., on the elevated structure or in the subways and tunnels. After these trains leave Sullivan Square there is no opportunity to return for any material that may have been forgotten and after the track on the elevated structure is broken it must be replaced for safe passage of the first train in the morning. Therefore, all material required for the following night on the rapid-transit lines is selected, fabricated, or otherwise prepared, and loaded on the cars, each piece being numbered or otherwise designated so that the material may be readily unloaded when the location of the repair work is reached, with no unnecessary rehandling. The old material removed is loaded on these trains and returned to the yard the following morning. Great care has to be exercised in the preparation and loading of materials used on the rapid-transit lines. The same care with respect to material used by the surface lines and other divisions of the maintenance department is also used, but in this case there is an opportunity to return to the yard for anything which may have been forgotten.

CHANGES IN THE RESERVE FUND

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	$393,028.41*	Jan.	$186,947.50†
Aug.	451,546.79*	Feb.	92,018.37†
Sept.	236,543.80*	Mar.	256,586.83†
Oct.	2,723.19†	April	181,694 29†
Nov.	29,302.22†	May	113,284.72†
Dec.	234,879.91†	June	92,917.54*

Profit and loss credit..... ..$137,259.76

Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*
Aug.	$408,570.65*

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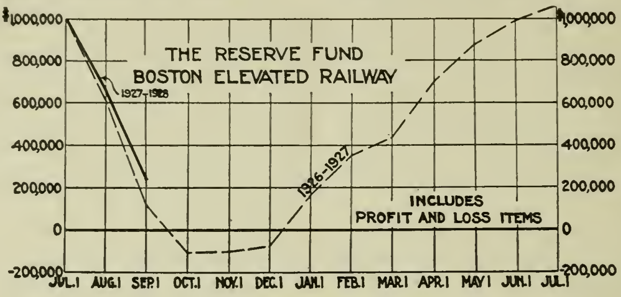
†Excess of revenue over cost of service.

*Excess of cost of service over revenue



AUGUST OPERATION

GENERAL FINANCIAL DATA	1927	1926
Cost of service exceeded revenue	$408,570.65	$451,546.79
Operating revenue per car-hour (A.E.R.A. std.)	$5.53	$5.18
Operating revenue per car-mile operated	56.05c	53.44c
Average fare per revenue passenger	9.271c	9.259c
Ratio operating expense to operating revenue	84.48%	85.58%
PASSENGERS CARRIED		
Revenue passengers	26,274,417	26,381,206
Per cent 5c, 6c and 6¼c passengers	18.47%	17.85%
Revenue passengers per car-mile operated	5.853	5.581
OPERATING FACTS		
Trips operated	584,042	620,648
Car-miles operated:		
Rapid-transit lines	1,163,744	1,178,062
Surface, two-man	1,653,253	1,910,074
Surface, one-man	1,216,433	1,226,329
Express, newspaper and sprinkler cars	939	1,356
Motor bus	454,351	410,958
Total miles operated	4,488,720	4,726,779
ACCIDENT DATA		
Accidents per 10,000 car-miles	2.02*	1.96*
Accidents per 10,000 bus-miles	3.76*	4.67*
Revenue passengers carried per reported accident	16,560	16,170
Average number of witnesses per accident	3.34	3.26
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	7	5
Employees complained of by car riders	81	82
Car defects reported per 10,000 car-miles	3.4	3.8
INFORMATION ABOUT POWER		
D.c. kw.-hr. output gross per month	15,842,160	16,508,140
Maximum kw. load	53,120	55,060
Tons of coal consumed for power	14,374	15,515
Lbs. of coal for power per d.c. kw.-hr. at cars	2.039	2.111
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	1.27c	1.21c
Per revenue car-mile	4.53c	4.22c
Kw.-hr. per revenue car-mile	3.554	3.495

*This does include miscellaneous accidents or derailments.

Sept. 22, 1927. EDWARD DANA, *General Manager.*

BOSTON ELEVATED RAILWAY
CO-OPERATION

Volume 6 OCTOBER, 1927 Number 10

Boston Elevated Close-Ups

THE PAINTER

(See Page 159)

To All 'El' Employees

THE Dorchester rapid-transit extension of the Cambridge subway and Dorchester tunnel will be in operation very shortly. The inauguration of the new service will involve much adjustment on the part of patrons and employees.

It is our part of the program to make the transition just as easy for the public as possible.

TEAMWORK WILL DO THIS

Employees should inform themselves regarding details of the changed service and be ready to give accurate and complete information. Where new duties are imposed these should be performed with efficiency and courtesy.

An occasion like this tests the mettle of an organization. I feel sure that ours will meet the situation.

Edward Dana

FIELDS CORNER STATION PRACTICALLY COMPLETE

Complete Development at this Point Also Includes Large Bus Garage and Central Heating Plant—New Station Is of One-Level Type

THE Fields Corner rapid-transit station is located between Geneva and Dorchester Avenues, at the approximate location of the former steam-railroad station on the Shawmut Branch of the New York, New Haven & Hartford Railroad. It is 2.4 miles from Andrew Square and will be the temporary terminal of the rapid-transit trains, pending the completion of the extension to Ashmont, near Peabody Square, where the permanent terminal is to be located.

At this location the Transit Department of the City of Boston and Boston Elevated Railway have developed a modern station and terminal for convenient interchange of passengers between rapid-transit trains and trolley cars and buses.

The station, with its approaches, covers an area of 6.8 acres and is located a short distance north of the Railway's office building, carhouse and yard.

At about the time that this rapid-transit extension was being planned, the use of buses as an auxiliary to the railway lines became more general, and it was decided that buses would be required in connection with the rapid-transit extension properly to take care of the district served.

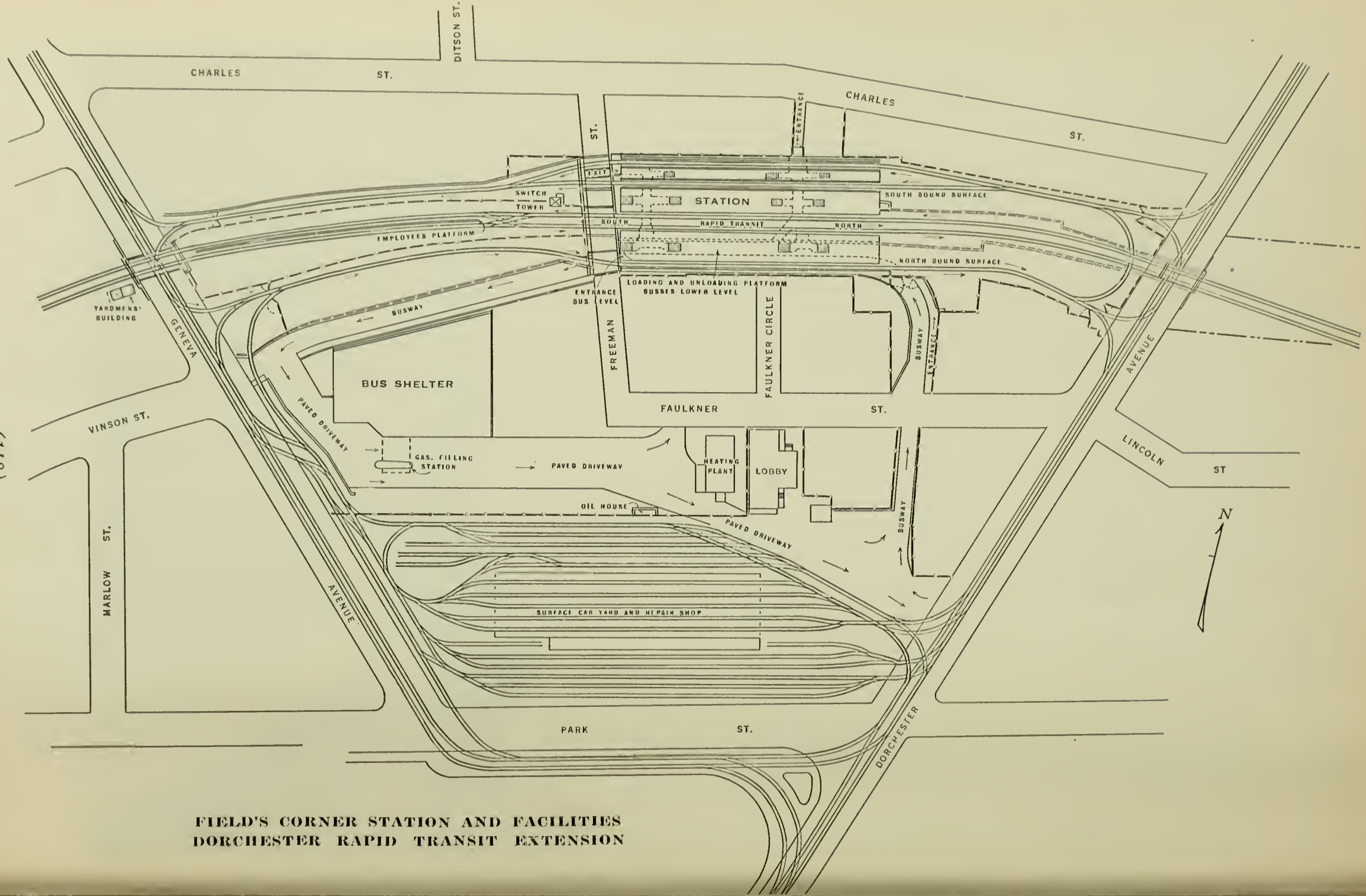
Between the area occupied by the rapid-transit station and the Railway property was a tract of land of sufficient size to permit the erection of a 100-car bus garage. At the request of the Railway, the Transit Department purchased this property, which, with the rapid-transit station and the Railway's property, gives an area of approximately 10 acres. There thus results a complete operating plant for rapid-transit trains, trolley cars and buses.

STATION IS OF ONE-LEVEL TYPE

The older type of rapid-transit terminal, such as the stations at Forest Hills and Sullivan Square, provides for rapid-transit trains on the upper level and trolley cars on the lower level. This requires passengers to ascend or descend, as the case may be, by stairs or escalators. In some respects this is objectionable, although a station of this sort requires less area. This matter was considered when planning the Fields Corner station and the Ashmont terminal. Improvement associations and others interested desired a one-level station for the direct interchange between trolley cars and rapid-transit trains, and it was finally decided to make the Fields Corner station of this type, as the distance between Geneva and Dorchester Avenues was sufficient to allow it.

The station is located approximately half-way between these streets. The

APPROACH TO FIELDS CORNER STATION FROM THE NORTH



FIELD'S CORNER STATION AND FACILITIES
DORCHESTER RAPID TRANSIT EXTENSION

trolley cars reach the upper level by inclined tracks having a grade of not over 5 per cent. The platforms are covered by a building 300 feet in length by 135 feet in width, of steel and reinforced concrete construction, with a steel-and-wood roof.

PROVISION FOR EXTENSION

The rapid-transit platform is long enough at the present time to accommodate 4-car trains, but provision has been made for extending the rapid-transit platforms 135 feet when 6-car trains are operated. The rapid-transit tracks pass through the approximate center of the station, the tracks being about 4 feet below the level of the platform.

Trolley cars with passengers for the intown rapid-transit trains enter from Geneva Avenue. The platform between the trolley cars and the rapid-transit track is 33 feet in width. This platform is divided into two parts. A "pay-leave" area, which is the first platform reached, is for the use of passengers leaving the trolley cars who have not previously paid their fares. Before entering the rapid-transit platform they pass through a barrier where the fares are collected. A "pay-enter" area is also provided for the convenience of passengers who have previously paid their fares and who wish to continue their journey on the trolley cars.

The Neponset and Milton cars, after discharging passengers at the "pay-leave" area, will pass around a loop and re-enter the station from the Dorchester Avenue end on the outbound platform. Here there are two trolley-car tracks, each track having a capacity of six cars. These cars leave the station by way of Geneva Avenue. The width of the platform between the rapid-transit track and the first trolley-car track is 30 feet, and between the two trolley car tracks the platform is 15 feet wide.

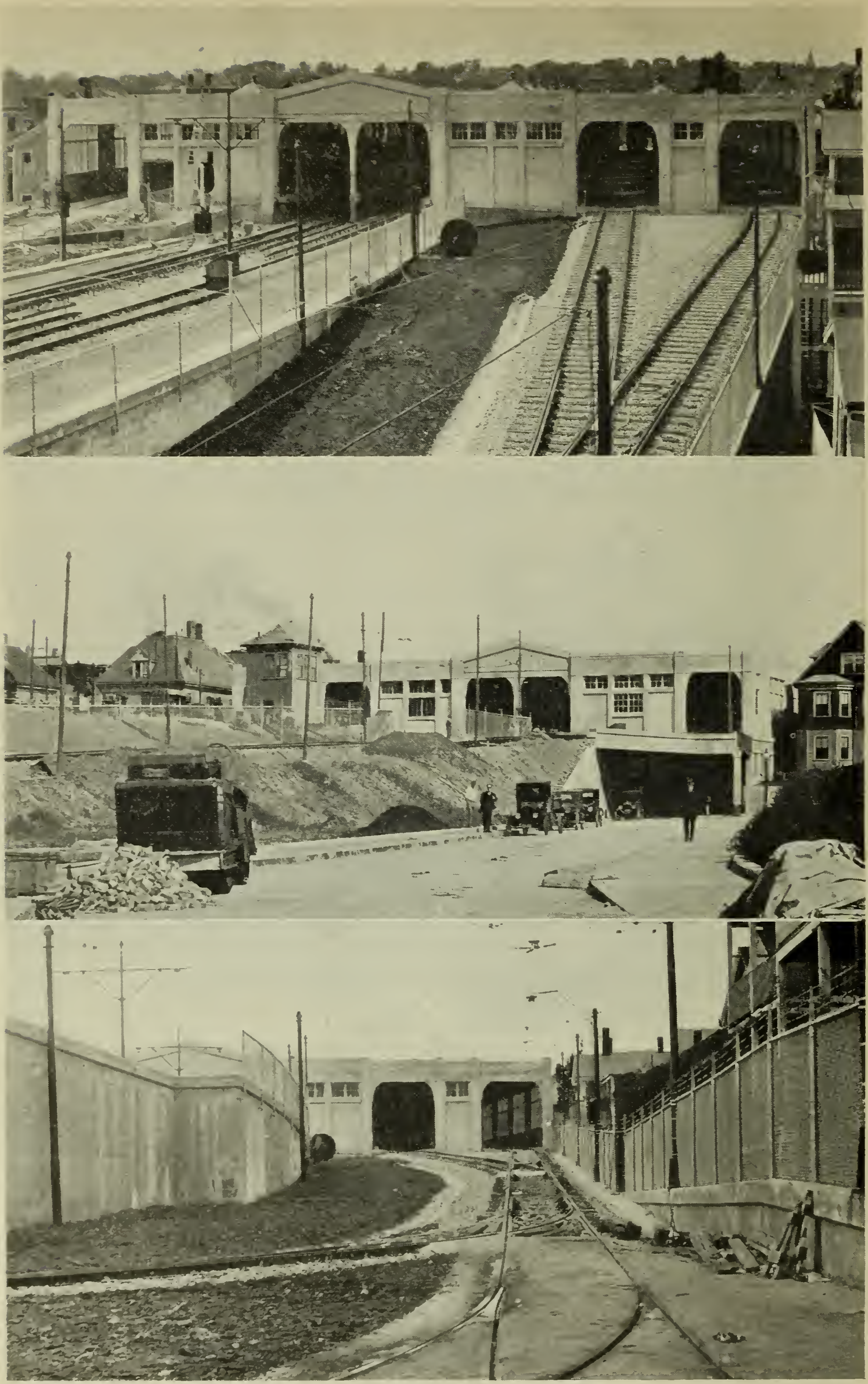
The Geneva Avenue-Grove Hall-Dudley Street cars and Geneva Avenue-Meeting House Hill-Andrew Square cars will enter the station from the Dorchester Avenue end and discharge and pick up passengers on the outbound platform, leaving the station by way of Geneva Avenue.

Cars for Massachusetts Station and the Dorchester Avenue-Andrew Station line will enter the station from Geneva Avenue to the "pay-enter" area, where they will pick up passengers who wish to continue their journey by trolley cars and leave the station by way of Dorchester Avenue.

AMPLE PROVISION FOR BUSES

There is a 20-foot busway through the station at the street level. Buses enter from the Dorchester Avenue side and pass out of the station at Geneva Avenue. The bus platform is 14 feet wide and divided transversely into two parts. One is a "pay-leave" area with a capacity of six buses. Passengers leaving

FIELDS CORNER STATION INTERIOR IN UNFINISHED CONDITION



VIEWS AT FIELDS CORNER STATION

Top, approach from north, showing entrance for rapid-transit trains and trolley cars. Middle, south end of station, showing busway exit at lower right. Bottom, street-car connection from Dorchester Avenue.

the buses here pass through the barrier and pay their fares before entering the station to take either trolley cars or rapid-transit trains. The buses then make an additional stop in the "pay-enter" area, with a capacity of six buses, where passengers who have previously paid their fares take the buses.

Entrances are provided at the street level from Dorchester Avenue and Faulkner Street, Charles Street and Freeman street. The main fare-collecting unit is located on the upper level, between the inbound trolley track and the inbound rapid-transit track. Fare-collecting units are also located on the bus platform and at the Charles Street entrance to the station. A total of eleven General Electric automatic passimeters and five Langslow passimeters are used in the various fare-collecting units. Convenient exits have also been provided at Charles, Faulkner and Freeman Streets by stairs and passageways from the upper level.

A 100-Bus Garage to Be Built

The site for the bus garage is now being prepared, not all of the buildings as yet having been removed. One unit will be built at this time, having an open floor area of 20,000 square feet, with a capacity of fifty-six buses. The foundation is to be concrete; the first floor is of concrete on fill, and the side walls of brick with steel sash and wood doors. The roof is to be of tar and gravel on pre-cast cement tile, supported by trusses with an average span of 131 feet. The side of the building toward Geneva Avenue will have two sections; one for motor repairs, and the other for office, stockroom, oil storage, lobby and toilets.

The section for motor repairs is to be a series of pits at the ground level, so that the buses may be run in on the main floor and be worked on very conveniently from underneath. Four large doors will provide convenient means of entrance and exit from the garage.

Central Heating Plant

A central heating plant is to be built, 45¼ feet in length by 33⅓ feet in width, of concrete, brick and steel. It will be equipped with one 78-inch horizontal return tubular boiler, a 500-horsepower cast-iron combination feed-water heater and storage tank and two duplex steam pumps for boiler feed. The operating steam pressure will be 24 lbs. A 100-foot self-supporting stack of 50 inches diameter will also be provided. This plant is to be used to heat the garage and waiting-rooms in the station.

A man is no bigger than the idea he can master.—*Commonwealther.*

Carelessness does more harm than want of knowledge.—*Benjamin Franklin.*

SUPERVISORS' ASSOCIATION FORMED

A meeting of men in supervisory positions was held at the instruction school, Sullivan Square, on Oct. 19, to consider the desirability of some kind of an informal association. It was decided to form such an association for the purpose of promoting acquaintance and furnishing information on broad topics related to supervisory work. The slogan, "Get Acquainted," formed the principal thought for the meeting. Addresses were given by H. M. Steward, superintendent of maintenance; John Lindall, superintendent of rolling-stock and shops; J. P. Boyden, superintendent wire and conduit division, power department, and E. A. Kelley, assistant to the superintendent of transportation. J. M. Patten, foreman truck shop, presided and D. J. McInnis, inspector, wire and conduit division, was secretary. A committee was appointed to prepare nominations and a suggested form of by-laws for consideration at the next meeting scheduled for Nov. 16. The program for that meeting will be in charge of a special committee consisting of J. M. Patten, J. A. Griffin, supervisor Div. 4, and P. E. Maw, supervisor, R. T. L.

All men in supervisory positions are invited to join the association and to attend the meeting of Nov. 16. It will be held at 7.30 P. M. at the instruction school, Sullivan Square.

WHAT MAKES THE WHEELS GO 'ROUND

By David S. Lawlor, Advertising Department, The Pilot, Boston, Mass.

I am Courtesy.
I am known by many as Politeness;
I have friends who call me Kindness.
Children love me and delight to meet
and have me with them.
Women are won by me; even more than
are won by valor.
Men in their hearts have the greatest
respect for me.
The world salutes me for it knows what
I have achieved.
I have conquered more than the sword.
I have helped more than money has
helped.
I have brought peace into the home, the
office and the workshop.
I have reconciled lovers, neighbors and
friends.
I have kept nations from war, blood-
shed and famine.
I am a representative of the Prince of
Peace, and I dwell with
My brother, Good-Will, and my sweet
sister, Charity, in a
Home where all is love and peace.

BOSTON ELEVATED RAILWAY COMMITTEE ON EDUCATION, 1927-28

Standing, left to right—R. Kundert (rolling stock and ships), J. D. Donovan (auditing), W. M. Evans (purchasing), James Donohue (power), J. A. Griffin (transportation), E. R. Peters (treasury), H. H. Norris (educational advisor). Sitting, left to right—A. G. Reynolds (maintenance), Miss A. J. Walsh (auditing, representing interests of women employees), Edward Dana (general manager), F. W. Casey (claims), E. M. Brooks (legal).

MR. DANA'S EDISON ANNIVERSARY RADIO TALK

AS part of the celebration, on October 21, of the 48th anniversary of the invention of the electric light, Edward Dana, general manager Boston Elevated Railway, was invited by the Edison interests to speak over the radio. He did so, following Mr. Edison, who spoke from a New York studio, and preceding Roger W. Babson, the business statistician. Mr. Dana spoke from Station WEEI, operated by the Edison Electric Illuminating Company, of Boston. His talk was on the desirability of congenial relations with the public. In substance it was as follows:

Congenial relations are a necessary prerequisite to success in all business contacts.

Congenial relations bespeak friendliness and a willingness to understand the true facts, which in turn leads to co-operation and successful contacts.

There was a day when the rights of the people needed protection in this country against the possible injury to the individual because of the astounding development of industry.

Life was slower in those days and hardly a soul had a vision of the complicated, interwoven civilization of today, which would be impossible without the service of the great public utilities.

In the attempt to control this rapid expansion period early scars and misunderstandings were created.

They are all relics of the past, however, and there is not the slightest necessity for the atmosphere of those days permeating the days of modern progress.

Our present-day civilization rests upon the great utilities as a rock-bottom foundation.

It is now necessary to have a clear understanding of, and fair treatment accorded to, the utilities today if greater economic progress is to be anticipated.

The utilities represent saving of capital invested in plant of the stupendous total of $26,000,000,000, or 7 billion more than the national debt. During the first seven months of 1927 over 1½ billions of money were invested in utilities. This is approximately 38 per cent of the financing of the country.

Present-day conditions have changed the old idea that public utilities were endeavoring to get all the revenue they could and give as little service as possible in return in order to show a profit. You all know how the cost of living has soared in the past ten years and how you have had to adjust your household budget to meet this condition. The great public utilities have had the same budget problem to meet in getting revenue to meet the expenses of increased wages and cost of materials and supplies which make up the working of these utilities. It is the present desire of all utilities to give satisfactory service for as low a charge as the cost of such service will permit.

Congenial public relations form a most important aspect of public utilities service—of equal importance to sound finance and a vigorous and capable management. These relations may be obtained in many ways, among which are—

AN INSPIRED PERSONNEL

We cannot hope for good results or good public relations unless we have an inspired personnel. A public utility is often judged solely by the acts of its employees. Rules will not make good public relations; if we do not have pride in our industry we cannot hope for these relations. Therefore, constant effort is being made by all the utilities to instill into their personnel the importance of good salesmanship, and it is felt that great strides have been made recently in this direction. In this connection the utilities welcome the assistance of customers today in making suggestions to employees or the management for improvements in service.

FORETHOUGHT REGARDING DETAILS OF THE SERVICE

Practical improvements should be made before public necessity or attention is called to their need. In this way when unexpected conditions arise proper explanation can be made to the public in order that they may know that everything possible is being done to meet emergencies. Therefore, when an emergency arises—a water supply is cut off, gas or electric service is crippled, delays to street cars occur—we ask you to have patience because the personnel in the utility affected earnestly do desire to do everything in their power to remedy the condition as soon as possible.

FAIR AND FRANK PUBLICITY

In explaining the facts, the utilities use the press, radio and many other avenues. Through such mediums the public may be kept informed of some of the problems that are back of many unsatisfactory public relations and an appeal is made for their co-operation in correcting these conditions.

Perhaps it would be interesting to hear a little about the evolution of the public utilities, which form the rock bottom basis of our utilities today.

The oldest utility is the water industry, for water was vended from skins and jars for many centuries before aqueducts were built, and that was in very early times. The Romans had a marvelous system of aqueducts, public fountains, etc. Water was first delivered to houses in England in 1562, and the first water system in the United States was built in Boston in 1652, supplying water to houses.

The first gas company in the United States with a record of continuous operation was a Baltimore company. It furnished gas in 1816. Today there are more than 15,000,000 customers for this utility.

New York had the first street cars, in 1832. They were of course, horse cars. Boston had none until 1856, but it had electric cars in 1889, only a year after their first successful use on a large scale, in Richmond. Electric railways today represent an investment of nearly $6,000,000,000.

The electric light industry practically began with a central station built in New York in 1882, and Boston followed three years later. The electric light and power industry has increased its generating capacity since 1882 from the few hundred kilowatts of the New York station to over 27,000,000 and its customers from 59 to 19,000,000.

The first telephone exchange was installed in 1876, in Boston, and it was Boston that furnished the money, foresight and courage to develop the great industry which now provides a telephone for every seven people in the country. The United States has 6 per cent of the world's population and 61 per cent of its telephones.

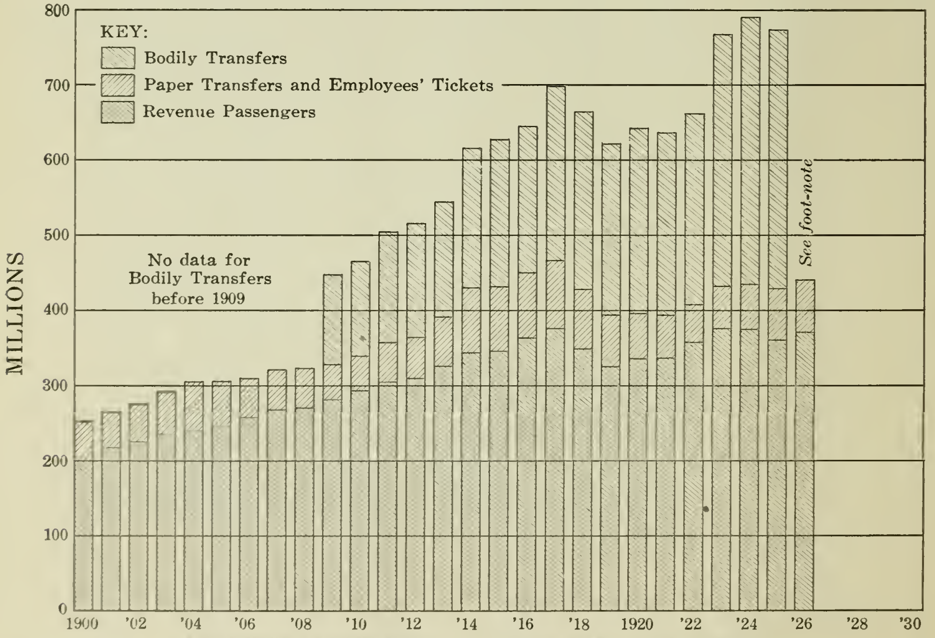
I am only giving you these comparisons to show the rapid growth of these industries, which could not have been accomplished without the co-operation of the users and appreciation on the part of the community of the fundamental necessity and value of these utilities to modern life.

In conclusion, let me assure you who are listening in that the men upon whom the duty and responsibility rests of rendering that service are your friends and that they have an earnest and sincere desire to keep pace with the modern times and render service which will be satisfactory to you.

RELATION OF REVENUE PASSENGERS TO LOCAL PASSENGERS

The chart which is reproduced below shows in a striking manner the details of the use of the transfer privilege by patrons of the railway during the past two decades. Of the total number of passengers transferring per month a small proportion use paper transfers; bodily transfers are overwhelmingly in the majority.

It should be understood that the numbers given for bodily transfers have to be based largely on estimate because there is no record of such transfers.



REVENUE PASSENGERS, TICKETS AND TRANSFERS

Data for nine months of 1910, in table, proportionately increased to cover full year. No estimate of bodily transfers made in 1926.

REVENUE PASSENGERS, TICKETS AND TRANSFERS

	Revenue Passengers	Free Transfers Collected (Paper)	Employe's Tickets Collected	Bodily Transfer Passengers (Partially estimated)	Total Free Passengers*	Total Passengers Carried
1900 Year ending Sept. 30	201,124,710	48,695,787	161,263	———	48,901,979	250,026,689
1901 “ “ “	213,703,983	52,053,383	166,961	———	52,265,364	265,969,347
1902 “ “ “	222,484,811	51,686,898	90,620	———	51,832,460	274,317,271
1903 “ “ “	233,563,578	57,377,827	84,738	———	57,512,292	291,075,870
1904 “ “ “	241,681,945	62,968,843	97,700	———	63,120,612	304,802,557
1905 “ “ “	246,941,776	57,361,202	88,160	———	57,504,224	304,446,000
1906 “ “ “	262,267,240	49,937,855	142,897	———	50,138,152	312,405,392
1907 “ “ “	271,084,815	49,678,791	211,432	———	49,950,077	321,034,892
1908 “ “ “	273,132,584	49,648,270	244,010	———	49,954,021	323,086,605
1909 “ “ “	281,008,471	50,092,064	249,123	115,820,633	166,228,034	447,236,505
1910 9 mos. ending June 30	220,127,890	35,995,320	200,398	93,899,865	130,095,583	350,223,473
1911 Year ending June 30	305,098,665	53,285,191	275,560	144,689,002	198,314,129	503,412,794
1912 “ “ “	310,310,009	56,639,907	370,620	149,797,415	206,873,339	517,183,348
1913 “ “ “	326,352,863	67,109,339	427,334	149,963,165	217,568,571	543,921,434
1914 “ “ “	343,181,049	74,910,209	471,837	195,053,476	270,462,925	613,643,974
1915 “ “ “	346,316,584	83,415,829	465,313	196,195,888	280,080,857	626,397,441
1916 “ “ “	363,477,041	85,621,020	517,602	195,361,223	281,501,940	644,978,981
1916 6 mos. ending Dec. 31	189,415,158	44,439,293	288,628	101,973,025	146,702,041	336,117,119
1917 Year ending Dec.. 31	381,017,338	87,908,652	663,354	228,970,643	317,544,005	698,561,343
1918 “ “ “	348,664,700	77,767,879	602,982	234,103,948	312,475,879	661,140,579
1919 “ “ “	324,758,685	68,240,625	997,172	223,932,601	293,170,402	617,929,261
1920 “ “ “	335,526,561	59,013,962	1,021,461	245,469,814	305,505,237	641,031,798
1921 “ “ “	337,252,080	54,098,843	978,649	242,867,322	298,944,814	635,196,894
1922 “ “ “	356,593,942	52,445,644	930,176	254,489,943	307,865,763	664,459,705
1923 “ “ “	382,149,697	54,389,260	904,641	331,360,202	386,654,103	768,803,800
1924 “ “ “	382,888,848	55,615,377	892,061	353,318,510	409,825,948	792,714,796
1925 “ “ “	365,036,286	61,375,944	925,386	353,332,393	415,633,723	780,670,009
1926 “ “ “	371,218,401	68,289,955	966,659	———	†69,256,614	†440,475,015

*This total includes small numbers of special transfers and free tickets.
†Omitting estimated bodily transfers.

The estimates are based on traffic counts, so that they give a fair approximation of the actual conditions. The expense of making the traffic counts, however, is considerable and the general facts regarding bodily transfers having been established, the Bureau of Audit discontinued for the present, with the estimate for 1925, the practice of reporting annually its estimate of the number of bodily transfers.

The fact is clear that transfers of both types, plus rides by employees (which form a negligible element in the total), now outnumber the revenue passengers. A close estimate of the total number of passengers carried can be obtained by doubling the number of revenue passengers. This will be under rather than over the true figure.

For those who prefer tabular statements of data to the graphic form, the accompanying table has been reproduced.

ENROLL EARLY FOR EDUCATIONAL COURSES

As this issue of “Co-peration” is being distributed the opening dates of the courses in the educational program are close at hand. Men and women who expect to participate in the program should hand in their enrollment forms promptly. If possible do not wait until the opening meeting of each course, although enrollments can be made then if necessary. Advance enrollments to date show a widespread interest in the program.

CO-OPERATION

By Henry V. Neal, Albany Street Shops

Adam let slip full many a groan
At having to live in this world all alone,
With lots of flowers and fruits and trees,
Beasts and birds and fowl and bees.
Yet somehow there was a missing link
But what it was he could not think,
’Till one day to his admiration
Eve came in, **Co-operation.**

Years rolled on and men apace
O’er land and sea filled many a place,
Sometimes beside the mountain side,
Sometimes upon the ocean tide.
And then they spread where man may go
From torrid sun to winter snow,
And tribes and races in formation
Were first in man’s **Co-operation.**

This land where now we dwell in ease
Was unknown far beyond the seas.
The ocean rolled beneath the sky,
And men were wondering where and why.
Stout hearts were needed for the spell,
But one there was who met it well,
Columbus made the combination,
Old world and new, **Co-operation.**

Then to this land came men galore,
Came rugged men to rugged shore,
On land untried they raised a tree
Whose root and branch was—Liberty.
With honest toil, not rich, but great,
They made the City, then the State.
Brave men, they made this wondrous nation
With its thirteen states, **Co-operation.**

Now grandly spreads our vast domain
From East to West a mighty chain.
Here art and science, skill applied,
Are leading all the world beside.
And round the world we speed, you know,
A whisper on the radio.
For Peace we send the invitation
To all men in **Co-operation.**

But greater wonders shall unfold
Beyond the wildest dreams of old,
When each of us will be a link
To join with noblest men who think.
We must advance with mind and heart,
Then, onward, boys, and do your part,
And man will reach his destination
With brain and brawn, **Co-operation.**

EVERYDAY ECONOMICS—III

In the preceding two articles Dean J. E. LeRossignol, Ph.D., L.L.D., of the College of Business Administration, University of Nebraska, has discussed income, wealth, capital, property, and economics and industrial evolution. In this issue he covers population and civilization in a style to interest all.

POPULATION

ONE of the chief results of the Industrial Revolution in Europe and throughout the western world has been a great increase in population.

In the year 1750 the population of England and Wales was about 6,500,000; in 1801 it was almost 9,000,000; in 1831 it was 13,800,000; and in 1921 it was 37,885,000.

This extraordinary growth has been due chiefly to the development of manufacturing and improvement in transportation by land and sea, enabling England to sell her manufactures at low prices in every part of the world and to obtain food, raw materials, and other manufactured goods in return.

A similar increase in population has taken place in most European countries. At the time of Columbus the population of Europe was probably less than 60,000,000; in 1760 it was not over 130,000,000, and in 1920 it was about 450,000,000. That is to say, the population of Europe increased by about 100 per cent from 1492 to 1760, and by 200 per cent from that time to this.

Still more rapid growth in population has taken place in America and other "new" countries. When the English first came to America there were probably not more than 25,000 Indians living in what is now New York State, and less than 1,000,000 in the entire area now occupied by the United States. That was because a large population could not subsist by hunting and fishing, and because of the high death-rate due to hardship and constant war.

The European settlers in America lived by agriculture, manufacture and commerce, as well as by hunting and fishing; so the country, as it was developed. could and did support a far larger population.

The European population of British North America, in 1640, was about 25,000; in 1700, about 260,000; in 1743, about 1,000,000, and the first census of the United States, in 1790, showed a population of 3,930,000. Fifty years later, in 1840, the population was 17,000,000; in 1890, it was 62,000,000; and in 1920 it was 105,000,000.

This tremendous increase has been due, first, to the vast natural resources of the country; second, to modern machinery and transportation, without which the resources could not have been so rapidly developed.

As it has been accompanied by a still more rapid growth in wealth and well-being, it seems to contradict the theory of Malthus, who held that population tends to increase faster than the means of subsistence, and the corresponding theory of Karl Marx that economic progress leads in the end to increasing misery.

Yet it must be admitted that much of our so-called development has involved the using up of natural resources which can never be replaced.

Our forests have been wasted, the fertility of our soil reduced, our natural gas well-nigh exhausted, our oil deposits depleted, and even our vast deposits of coal perceptibly reduced.

So, unless science comes to our aid with discoveries and inventions enabling us to exploit the tropics, to get heat and power from the sun and bread from stones, we need expect no such increase in population and wealth in the next century as we have had in the past.

The fact is, we are passing out of the pioneer stage of rapid development and lavish expenditure, and must very soon settle down to careful husbandry and frugal living and be satisfied with slow and steady progress.

THE ECONOMIC BASIS OF CIVILIZATION

By its derivation, the word civilization (Latin *civis*, a citizen) means citified society, as distinguished from rural, rustic, or boorish ways of life. And, no doubt, civilization originated in towns or cities, and there were few civilized people elsewhere, though nowadays that is not the case, because of improved transportation and communication.

It is hard to say just what civilization is, except by telling the marks or signs by which we distinguish civilized people from barbarians and savages. Among them are good manners, regard for personal rights and human life, law and

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order, arts and crafts, architecture, sculpture, painting, literature, music, science and education.

These things are, in fact, refinements or luxuries which man will have when he is supplied with food, clothing and shelter and has time and energy to give to higher things. First existence: then subsistence; then all the amenities of civilized life.

In the history of mankind there is no record of civilization without a basis of material prosperity, and, naturally, that did not come until men had reached the agricultural stage, had a fixed abode, had built towns and cities, and engaged in commerce with neighboring peoples.

Perhaps the most ancient civilization of the world was that of Egypt, based on the fertility of the Nile Valley and a strategic location between the Indian Ocean and the Mediterranean Sea.

Another very ancient civilization was that of Chaldea, Ninevah, Babylonia and Persia, in the valleys of the Euphrates and Tigris, with abundance of irrigated land and at the junction of caravan routes between Egypt, India, China and other countries.

Still another important center of civilization was Phoenicia, whose great cities, Tyre and Sidon, had connections by land and sea with all the known world and were carriers of civilization to all parts of the Mediterranean. Our alphabet, for example, probably came through them from Egypt.

Greece was favorably situated for commerce between the Mediterranean countries and the Black Sea, whence the ancients obtained large supplies of grain. Athens was a commercial city before she became a great center of culture in the age of Pericles. Without wealth, her wonderful civilization would have been impossible.

Rome was not noted for her agriculture, manufactures or commerce, but was a military power, rather, exploiting the rest of the world. But her greatness was based on the prosperity of her vast empire, from which she obtained food, and to which she gave government, law and order.

And in modern times the rule holds good of Italy, Spain, France, Holland, England, Germany, the United States, and all the rest. Prosperity is the mother of civilization.

Man was not originally a civilized being; but, like a child, he had within him latent powers requiring only time and opportunity for their development.

So long as he was toiling and fighting for bare existence, his higher nature was suppressed and confined. But when he had provided for his most urgent wants there was always something more to be desired—better food, better clothing, better shelter and more and better things of every kind.

Economic or material progress, then, is prerequisite to civilization, as the rich soil in which the latent powers of man may unfold and come to full fruition.

The Business World

Man is a social being, and as such unites with his fellow men in various overlapping and interlacing groups, according to family relationship, political leanings, social affiliations, religious belief, or economic interests.

Donald McGregor, for example, may be a member of a particular family and clan, of Scottish ancestry, an American citizen, a Republican in politics, a Presbyterian in religion, a farmer by occupation, a member of an agricultural association, a golf club, and other organizations. He may have many social affiliations, but in so far as his occupation is concerned, he is a member of the business world.

The business world, then, as distinguished from the political, religious, or sporting worlds, is composed of economic groups; that is, of people divided and united according to the way in which they get their living. So we have farmers, manufacturers, merchants, doctors, lawyers, clergymen, teachers, and all the rest.

There are those who affect to despise business, as though it were something base; but they belong to the business world for all that, whether as producers or consumers, or both.

Even professional people, who like to call their pay salaries or fees rather than wages or profits, are in the business world as givers and receivers. Even if they were to give their services for nothing, they could not escape from the economic nexus so long as they continued to eat and drink, to require shelter and clothing.

All people, then, belong to the business world as consumers. And most men and women and some children are producers also. These are what we may call the personnel of the business world.

Corresponding to the vast and complex organization of persons in the various occupations is an organization of the things with which these persons work.

Farmers have their land, cattle and horses, barns, machinery, dwellings, crops, vehicles, and all the equipment of material goods with which they have to do.

Manufacturers, also, have some land, but most of their equipment consists of buildings, machinery, raw materials, finished products, transportation facilities, and the like.

And so in most, if not all, other lines of business, there is a dual organization of persons and things working together for a common purpose: the production or rendering of goods and services for themselves and other people, but chiefly for the latter.

Most business people, perhaps, are thinking chiefly of profit, or, as we commonly say, of making money; but as most of them produce goods and services for the market, that is, to exchange for other goods and services, they cannot avoid supplying the wants of other people and thus contributing to the general good.

So we must think of the business world as it is, a going concern, incessantly active during working hours, and constantly turning out a stream or flow of goods and services by which people live and enjoy life.

And thus the gigantic and complicated mechanism of the business world provides food, clothing, shelter, and all other things for millions and hundreds of millions of people, day by day and year by year—a veritable miracle of production, exchange, and distribution.

COMMON SENSE IN TABLOID FORM

For thousands of years it has been the habit of thoughtful people to put the results of their experience into condensed form so that it could easily be passed on from generation to generation. The habit still continues and everywhere we see good examples of these epigrams, aphorisms, maxims or proverbs, or whatever you wish to term them. A few have been selected for reproduction here. Employees are invited to send others to the general manager's office for possible use in "Co-operation." We are indebted to the Commonwealth Steel Company for this start.

Clock watchers are never top notchers.—*Commonwealther.*

Be a live wire and don't get stepped on.—*Commonwealther.*

Achievement is the result of proper co-ordination between work and rest.—*Adams.*

To live, the world must produce more and talk less.—*W. A. Appleton.*

Happiness comes in doing not what one likes, but in liking what one has to do.—*Commonwealther.*

Courtesy is the coin of which the more we spend the more we receive.—*Commonwealther.*

A man who goes ahead and does it, goes ahead.—*Kodak Salesman.*

A smile always has its face value.—*Commonwealther.*

The noblest motive is the public good. *Virgil.*

Most of us get what we deserve, but only the successful admit it.—*Commonwealther.*

A competent employee can't be held down, nor an incompetent one be held up. —*Commonwealther.*

Never put off until tomorrow what should have been done yesterday.—*Commonwealther.*

It is just as hard to stay at the top as to get there.—*Commonwealther.*

No man is a failure until he admits himself a failure.—*Commonwealther.*

Skill is the ability to do the right thing the first time.—*Commonwealther.*

The hits you made yesterday won't win today's game.—*Commonwealther.*

It's never too late to mend, but don't put it off until you forget how.—*Commonwealther.*

Stop to think, but don't stop thinking. —*Commonwealther.*

Emulate the pin. Its head keeps it from going too far.—*Commonwealther.*

Some people grow under responsibility — others merely swell. — *Commonwealther.*

Co-operation is spelled with two letters —W-E.—*G. M. Verity.*

Co-operation and "letting the other fellow do it" are two different things.—*Commonwealther.*

When you pass out the milk of human kindness, don't skim it.—*Commonwealther.*

An optimist is one who makes lemonade out of the lemons handed him.—*Commonwealther.*

When the outlook is not good try the uplook.—*Commonwealther.*

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*The Commonwealther is the house organ of the Commonwealth Steel Company.

ELEVATED CLOSE-UPS

The Painter—Maintenance Department

(See Illustration on Front Cover)

THE picture on the front cover of this issue of "Co-operation" represents a painter engaged in painting a column of the elevated structure.

The protection of the steel of which the elevated structure is composed is one of the vital problems with which the railway is concerned. There are about eleven miles of elevated structure, not including the additional structure necessary for storage yards at the various terminals.

There are 53,340 tons of structural steel, having an exposed surface of nearly 6,000,000 square feet. Thus, if the paint on the structure is to be properly maintained, not less than one million square feet should be repainted annually. The Atlantic Avenue and Everett sections of the elevated structure require the more frequent painting, owing to local conditions which cause more rapid deterioration of the surface coating.

The process of repainting the structure involves the following steps: the structure is first cleaned of dirt and brakeshoe rust by means of whisk brooms and wire brushes; then the rusty spots on the steel are given an additional cleaning to remove rust and scale as far as possible; then a priming coat of paint is given. This operation is followed by the putting on of the finishing coat, and then the repainted portion of the structure is ready for another four or five years of service.

In addition to the street structure, the elevated and subway stations, the fencing around the various properties, the carhouses, garages and shops all require frequent painting.

Great care must be exercised to protect the painter while working from falling, from contact with the third rail, and also contact with the trolley wires. To this end all of the ladders on which he works, together with the planks and rigging which he uses, are subject to rigid inspection.

MR. DANA IS PRESIDENT OF T. & T. ASSOCIATION

At the annual convention of the American Electric Railway Transportation & Traffic Association, held in Cleveland, Ohio, Oct. 3 to 7, Edward Dana, general manager Boston Elevated Railway, was elected president for the coming year. He has been a vice-president of the association for several years. By election to the presidency he becomes also a member of the executive committee of the American Electric Railway Association.

COURTESY APPRECIATED

On Oct. 10 a patron from a suburb of Chicago, Ill., took the trouble to commend an "El" conductor, substantially as follows:

"Last night I boarded an inbound subway car and discovered I had left my purse in the car of a friend. The conductor very graciously paid my fare and offered to advance me whatever change was necessary to reach my destination. I have been from coast to coast in my travels, which are continuous, and I have never found the personnel of the Boston Elevated excelled in the courtesies and service which mean so much to the traveling public, especially strangers. This most unusual courtesy was beyond the discharge of the conductor's regular duties, and I am going to give the Boston Elevated the most favorable advertising possible. The city of Boston is fortunate in having as pleasant a public-utility personnel as this, and the Boston Elevated is to be congratulated on its employees.

IMPORTANT FACTS FROM THE 1926 ACCIDENT REPORTS

1. One out of every 13 workers suffered a lost-time injury.
2. Each injured person lost an average of 78 days.
3. Average time lost per person employed was six days.
4. For every 140 non-fatal accidents there was one fatality.
5. The number of companies reporting their records increased 42 per cent. (1,725 companies reported in 1926, 1,231 in 1925.)
6. Accident frequency rate of all plants increased from 30.60 for 1925 to 31.87 for 1926.
7. Accident severity rate of all plants increased from 2.02 in 1925 to 2.50 in 1926.
8. Each employee worked an average of 450 hours less in 1926 than he did in 1925. — *National Safety News.*

CHANGES IN THE RESERVE FUND

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	$393,028.41*	Jan.	$186,947.50†
Aug.	451,546.79*	Feb.	92,018.37†
Sept.	236,543.80*	Mar.	256,586.83†
Oct.	2,723.19†	April	181,694 29†
Nov.	29,302.22†	May	113,284.72†
Dec.	234,879.91†	June	92,917.54*

Profit and loss credit..... ..$137,259.76

Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*
Aug.	$408,570.65*
Sept.	$147,204.65*

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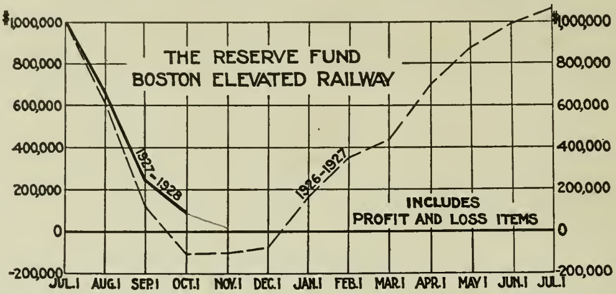
†Excess of revenue over cost of service.

*Excess of cost of service over revenue



SEPTEMBER OPERATION

GENERAL FINANCIAL DATA	1927	1926
Cost of service exceeded revenue	$147,204.65	$236,543.80
Operating revenue per car-hour (A.E.R.A. std.)	$6.08	$5.65
Operating revenue per car-mile operated	61.44c	58.08c
Average fare per revenue passenger	9.303c	9.297c
Ratio operating expense to operating revenue	75.65%	78.94%
PASSENGERS CARRIED		
Revenue passengers	27,855,837	28,172,344
Per cent 5c, 6c and 6¼c passengers	17.85%	17.12%
Revenue passengers per car-mile operated	6.405	6.059
OPERATING FACTS		
Trips operated	565,103	604,470
Car-miles operated:		
Rapid-transit lines	1,122,357	1,212,963
Surface, two-man	1,599,920	1,854,840
Surface, one-man	1,185,714	1,165,062
Newspaper and sprinkler cars	988	2,526
Motor bus	439,929	416,689
Total miles operated	4,348,908	4,652,080
ACCIDENT DATA		
Accidents per 10,000 car-miles	2.10*	2.16*
Accidents per 10,000 bus-miles	2.23*	2.74*
Revenue passengers carried per reported accident	18,010	17,110
Average number of witnesses per accident	3.43	3.71
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	7	8
Employees complained of by car riders	111	88
Car defects reported per 10,000 car-miles	2.9	3.3
INFORMATION ABOUT POWER		
D.c. kw.-hr. output gross per month	15,735,700	16,584,460
Maximum kw. load	54,760	61,910
Tons of coal consumed for power	13,721	14,667
Lbs. of coal for power per d.c. kw.-hr. at cars	1.959	1.987
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	1.22c	1.18c
Per revenue car-mile	4.42c	4.21c
Kw.-hr. per revenue car-mile	3.618	3.577

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*This does include miscellaneous accidents or derailments.

Oct. 22, 1927. EDWARD DANA, *General Manager.*

BOSTON ELEVATED RAILWAY

CO-OPERATION

Volume 6 NOVEMBER, 1927 Number 11

Boston Elevated Close-Ups

IN THE BUREAU OF AUDIT

(See Page 175)

To All 'El' Employees

SELLING transportation is the job of every person in the employ of the Railway.

Those in the transportation department have the most obvious selling responsibility, because the men on the cars, on the platforms, and on the streets are in direct contact with the public.

But the power department also has its selling function in keeping the wheels moving dependably.

Similarly, the maintenance department makes the service attractive by good maintenance and improvement of tracks and equipment.

And the rolling-stock and shops department helps sell service by furnishing attractive and clean cars.

In short, all departments are contributory to our main purpose—to sell first-class transportation to the public.

It is to the interest of all of us that the Railway should be successful.

Are we, each and all, in our individual jobs doing those things that will conduce to that success?

Edward Dana

BUSWAY AT FIELDS CORNER STATION

SERVICE TO FIELDS CORNER INAUGURATED

Extension of Harvard Square-Andrew Square Subway Line Now Permits a 14-Minute Running Time From Park Street to Fields Corner—Details of Track Construction Are Given

ON Saturday, Nov. 5, at 5.20 A. M., the extension of the Dorchester rapid-transit line of the Boston Elevated Railway was opened to Fields Corner. With a gilded hammer Mayor Nichols had driven the last track spike three days before, and on Nov. 4 there had been an official inspection by the Boston Transit Commission. Thus the running time from Park street to Fields Corner is now 14 minutes.

The salient facts in regard to this extension were given in a paper by E. L. Lockman, assistant to the superintendent of maintenance, read before the New England Street Railway Club on Oct. 27. The following items were abstracted from that paper:

Previous to 1923 the residents of the Dorchester district of Boston had for several years urged the necessity of improved transportation facilities. It was suggested, among other things, that the Cambridge-Dorchester tunnel be extended to Meeting House Hill and possibly beyond that point. During various discussions the proposition of using one or more of the branch lines of the New

APPROACH TO EXTENDED-TUNNEL PORTAL

Haven Railroad was advanced by Charles A. Ufford. The Department of Public Utilities and the Transit Department of the city of Boston, acting as a joint board in 1922, reported to the Legislature a comprehensive rapid-transit system for the Dorchester district. On May 25, 1923, Governor Cox approved "An Act for the Extension of Rapid Transit Facilities in the Dorchester District of the City of Boston." This act was accepted by the City Council and approved by the Mayor of Boston on Sept. 12, 1923. After surveys and estimates had been made, a plan acceptable to those interested and the Boston Elevated Railway was approved.

The Shawmut Branch, extending from the main line of the Boston Division of the New Haven Railroad at Harrison square to Milton and Mattapan, a distance of approximately 4.25 miles, with double track to Milton and then single track to Mattapan, was purchased by the city from the New Haven Railroad. In order to connect the existing Dorchester tunnel of the Boston Elevated Railway system with the Shawmut Branch it was necessary to extend the tunnel from Andrew square terminal under the New Haven tracks and under Boston street, then curving to the left under Dorchester avenue and coming to the surface beyond Dorchester avenue parallel with the railroad tracks. From this point to Harrison square the Transit Department was obliged to purchase additional land and move the four tracks of the New Haven Railroad to the east in order to provide a two-track right-of-way 35 ft. in width for rapid-transit purposes.

The act provided that the extension of the Dorchester tunnel was to be equipped by the Railway in the same manner as all subways and tunnels previously built and leased. For the balance of the Dorchester rapid-transit extension the equipment, except rolling-stock, was to be provided by the city. By mutual agreement it was decided that all connections with the rapid-transit extension occuring within the public highway were to be installed and owned by the Railway. These connections included trolley tracks, special trackwork, trolley wire, poles, feeders, conduits, etc.

When it came to the proposition of building tracks and installing signal and power apparatus, the Transit Department felt that this work could be done best by the Boston Elevated Railway, as that company had much greater experience than any available contractor. The act provided that the work could be let without competitive bids and a contract was made with the Railway covering the installation at cost plus an allowance of not more than 10 per cent for engineering, overhead, etc.

TRACK IS SOLIDLY CONSTRUCTED

Material required to equip the extension from Andrew square to Fields Corner included 29,016 tons of crushed stone ballast, 14,229 6x8-in. hard pine ties, 58,269 ft. of 85-lb. A.S.C.E. rail for the track and 24,874 ft. of the same section for the third rail, 14,000 ft. of special guard rail. 74,369 screw spikes, 20,626 tie plates and 60,250 malleable castings.

In the construction of the track the

(Please turn to Page 168)

APPROACH TO SAVIN HILL STATION

SOME INTERESTING PROBLEMS TO BE SOLVED*

In Opening the Series of Transportation Department Group Conferences the General Manager Emphasized Selling Transportation, Reducing Accidents and Operating Economically as Essential to Boston Elevated Railway Success

By EDWARD DANA
General Manager, Boston Elevated Railway

LAST year we used the slogan, "Save 2 per cent," as a suggestion for helping meet the budget. That slogan produced results, but we are not out of the woods. Since last May, for some reason, traffic has been dropping at an average rate of 500,000 revenue passengers a month as compared with the preceding year, so that the current budget has to be adjusted for a corresponding shrinkage. In spite of this, however, for the first four months of the fiscal year, we are better off by about $270,000 than we were at this time last year.

But we face the winter, and we face also the decreasing "riding habit," due in part to slackening of business and to the approach to a presidential year. Building has partly caught up with the demand, and the "saturation point" of automobile riding has not yet been reached.

SELLING OUR SERVICE

Thus we have the problem of keeping up the service to meet the requirements of the public, at the same time eliminating unnecessary service at some points for the good of the service as a whole. Then the service must be sold to the public. In this all departments have their part. As individuals and as groups, we must "think service" as we are brought into contact with our problems. The ways in which these problems are solved determine the success of the organization as a whole or its partial failure. Each of us may well ask himself whether his contribution helps create a margin or a deficit.

The proper rendering of our service, as in football, requires first, team play. In place of the one-time loyalty to an individual there is now loyalty to the team. When emergencies arise it is the duty of those of us who are in touch with the situation to do our best under the circumstances, no matter what they may be. When this is not done the result is a sore spot in our public relations. When we "fumble the ball" conditions may arise which eventually require a surgical operation for their cure. We are partners in the business of selling transportation, and our attitude should be the same as if we were partners in any other business enterprise.

Our cars and tracks are maintained in better condition than formerly and better than those of most street railways, but they require intelligent operation. There is the danger that operating jobs may become stereotyped, that men may get into a rut. It is necessary for each man to use his own brains in dealing with the situations which arise from day to day. No matter what the orders or routine may be, there is opportunity for individual thought and effort. Efficient individual service means more business and better satisfied customers.

Men in supervisory positions should see that erroneous practices on the part of the men whose work they supervise are corrected. The continuation of wrong practices produces a bad effect on the public. In the correction of wrong practices tact must be used, so as not to arouse antagonism.

This reminds me of an excellent physician who had the unhappy faculty of arousing the opposition of his patients. He got results, but people did not like him and his practice fell away. During the war he went into service and was successful as an army surgeon because efficiency rather than tact was the first consideration in war service. Our work is different; we require tact all the time.

Let us realize that we are all working for the Railway; that we are fellow employees, getting our pay from the same source. Let us each take an intelligent, thoughtful interest in our jobs, and particularly in our contact with the public.

THE ACCIDENT PROBLEM

About two years ago it became evident that there was an upward trend in accidents. With due allowance for the more difficult operating conditions caused by automobile and pedestrian congestion, the increase was becoming serious. Arrangements were therefore made for a careful study of the facts by a disinterested agency. Attention was to be directed to helping the high-accident man.

That some men needed special attention was illustrated by the 40-week record for one man: Total, thirty accidents, involving injury to seventeen passengers, four car doors broken, four car windows broken, two cars scraped, nineteen automobile fender and mud guards bent or broken, and nine automobile headlights, tanks, running boards, etc., broken.

Such a case presents a real problem. The high-accident man does not necessarily merit harsh treatment. There is probably a reason behind this record, a background for it. Our study is to ascertain this reason, to get at the root of the matter. We want to save the men for the service of the Railway. Twenty years ago the solution would have been to eliminate, say, 250 men, who by offhand decision were assumed to be careless on the highway. But that is not the modern way. Now the aim is to train high-accident men to avoid accidents, and particularly to study the causes of frequently-recurring accidents of the same type. In this the cooperation of all car operators will help us in arriving at correct conclusions.

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*Abstract of address at opening meeting of Transportation Department Group Conferences. Jos. A. Griffin, chairman, at Sullivan square, Nov. 4, 1927.

Making and Meeting the Budget

With our declining revenue we must critically examine every item of the budget. Our recent experience in analyzing wastes enables us to locate those points where the largest wastes occur.

In a sense, this is a critical year. We are at the end of ten years of public operation. The Legislature is working on the big problems in economics of what step to take next. That does not concern us, who are operating the road. It is for each of us to do his duty.

Reverting again to the analogy of football, the real success of the game is on the playing field. We are at present the players. In solving our problems we need to have all available information regarding any question that comes up.

For example, in the matter of adjusting service here and there to meet requirements, the problem must be solved like one in algebra. It is not simply an effort to please one community or another; not simply getting more cars, adding lines, adding trips, etc. It is a problem of eliminating waste, of balancing and adjusting the service properly to meet the varying needs.

Of course all waste cannot be eliminated, some lines must be run at a loss. But the whole thing must be carefully studied and balanced.

There are many places where attractive additions to the service could be made, but we simply haven't the money to make them. It's like the game of checkers. A couple of kings might help a player materially, but he has only so many pieces on the board.

I want each employee of the Railway to work this year with enthusiasm. I am pleased to see you interested in this educational work. Do your job, and think while you are on the job and you need not worry about the future. Enthusiasm insures success in transportation just as much as in the oil business or any other business. But have your own enthusiasm and don't let hearsay about this, that or the other, interfere with the quiet and intelligent performance of your job.

The need for enthusiasm is here as in a game of football. It is practically impossible for a team to win unless it goes onto the field feeling that it can win. Let us take that attitude. No doubt, many items of the Railway operation can be improved. We try to weigh every suggestion that is received. Out of this has come improvement. We hope by July 1, 1928, to report an increase in our business, through the desire of the people to buy our service because this service appeals to them as attractive and economical.

CHANGES IN PENSION LIST

In the August, 1927, issue of "Cooperation" a report regarding the pensioners was given. On Aug. 1 there were 389 names on the list. Since then the following twenty-four names have been added:

Pearl A. Joy, wrecking foreman.
Charles H. Bond, sub-foreman painter.
Patrick Kenney, stableman.
M. J. Falsey, janitor, C. P. S.
George B. Jones, conductor.
John A. Mullaney, car cleaner.
Patrick Nee, trackman.
J. P. O'Neill, station receiver.
A. Pauletto, laborer.
Frank S. Wiley, motorman.
E. A. Littlefield, motorman.
C. P. Stanton, machinist specialist.
Conrad Bauer, operation.
Edmond Cotter, special groundman.
O. E. Carpenter, operator.
Peter Welch, specialty cableman.
Mrs. M. Bowden, cleaner.
George E. Deguio, operator.
William J. Coleman, starter.
Edward Fenerty, motorman.
Thomas Berrigan, operator.
William J. Guider, motorman.
Herbert C. Catchpole, conductor.
Mark Lydon, laborer.

Seventeen pensioners have died since August 1, as follows:

J. F. Bracy, collector.
M. Fitzgerald, crossing tender.
Thomas Joyce, trackman.
H. N. Hall, gateman.
Patrick Smith, hostler.
M. N. Chapman, motorman, Div. 2.
John Montgomery, motorman, Div. 2.
L. A. Pratt, carpenter.
Thomas Swan, Motorman Div. 2.
Patrick Nee, trackman.
G. D. Coburn, painter.
John Mehegan, motorman, Div. 1.
Michael Keaveney, teamster.
Merrill N. Bent, clerk.
Frank J. Corey, motorman, Div. 4.
William R. Clapp, conductor.
James M. Marshall, warder.

These changes bring the total number, as of Nov. 15, to 396.

SURFACE-CAR UNLOADING PLATFORM AT NORTH STATION

NEW CONVENIENCES FOR PATRONS AT NORTH STATION

The accompanying photographs show some of the many improvements made during 1927 at the trolley-car portion of North Station.

The old wooden shelter for passengers boarding cars going into Tremont Street Subway has been removed and a new shelter, also constructed of wood, 96 feet in length by 16 feet in width, has been erected. A waiting room 8 feet by 16 feet, and heated with electric heaters, was included in the improvement.

The track opposite this shelter was rebuilt and located farther away from the Canal Street fence in order to provide additional room for the persons who

NEW WAITING ROOM AND SHELTER IN ENCLOSED AREA AT NORTH STATION leave from the right-hand side of the cars to go through the exit on Canal street.

The front, or entrance to the station, was remodeled and a battery of automatic dime-in-the-slot passimeters was installed in place of fare boxes for collecting revenue. The concrete platforms directly under the elevated station were rebuilt and lowered to correspond with the type of platform in use in the stations in the subways.

The fences enclosing this area were relocated and reconstructed and the unused stairways and bridge at the northerly end of the elevated station to the outbound surface station were removed.

In general, the extensive repairs, including painting, drainage, cleaning up, etc., which have been made, have materially improved conditions at this important station.

DORCHESTER EXTENSION

(Concluded from Page 164)

road-bed, or sub-grade, was first rolled with a steam roller and the ballast up to the bottom of the ties was delivered by motor truck. The minimum depth of ballast under the ties is 12 inches. After the rails and ties were in place, ballast for tamping purposes was delivered by car. The ballast is dressed off level with the ties and on the outside of each track it is sloped off to the level of a footwalk 2 feet below the top of the rail.

The entire line is block-signaled, the signals being of the 3-color light type. There are thirty blocks averaging 8,000 feet in length. Each signal is equipped with an electric automatic stop to prevent a train from passing a signal indicating "danger."

The entire length of the rapid-transit right-of-way is protected by a chain-link fence 6 feet high. To prevent possibility of accidents this fence has been grounded in several places. The length of the fence, including both sides, together with auxiliary fences at certain stations, is 32,070 feet, and it was necessary to provide 3,207 foundations, with a concrete beam between foundations, requiring a total of about 2,000 cubic yards of concrete.

STATIONS

The passenger stations at Columbia road and Savin Hill are way stations of the island type. Details of the Columbia station were given in the issue of "Co-operation" for July, 1927. The Savin Hill station is very similar. The Fields Corner station was described in the last issue.

Of the stations still to be built, Shawmut station, 3.06 miles from Andrew square, between Mather street and Centre street, will be of the subway type with separate platforms for each track; the platforms will be 435 ft. in length by 12 ft. wide. In this case it was found advisable to build the platform for the length necessary for six-car trains, but only 300 ft., to accommodate four-car trains, will be equipped. The entrance building or headhouse will be located in the covered section over the station platforms.

Ashmont terminal, 3.6 miles from Andrew square, will be located just south of Peabody square at the approximate location of the Ashmont station of the New Haven Railroad and will be the terminal for rapid-transit trains and high-speed trolley line from Mattapan and Milton. There will also be local trolley-track connections as well as ample capacity for buses. This terminal was described in the March, 1927, issue of "Co-operation." It is anticipated that the number of movements of rapid-transit trains, trolley cars and buses at this terminal, when the entire extension is in full operation, will be equal to, if not in excess of, the total car movements at Park street station in the Tremont street subway.

South of Ashmont terminal, bordering on Codman street, there will be provided a rapid-transit yard, containing eight tracks and a loop which will accommodate 90 Cambridge subway cars. The yard is sufficient to provide an ultimate storage for 206 cars along with a suitable repair shop.

PARK STREET-PEABODY SQUARE SUBWAY

Another item of interest, south of the section now in operation, is the covered section or subway between Park street and Peabody square, a distance of 4,150 ft. It was first intended to build this section in an open cut, providing substantial retaining walls on either side and abolishing grade crossings at five streets. It was found, however, that the retaining walls would have to be of very heavy construction and that it would be fully as cheap to build a subway with a light roof construction. Further, the operating conditions would be much better in a subway than in an open cut, particularly on account of the probability of the cut filling with snow during heavy storms.

VACATION

Little bank roll, e'er we part.
Let me press you to my heart.
All the year I've worked for you,
I've been faithful, you've been true.
Little bank roll in a day
You and I will go away
To some truly festive spot.
I'll return, but you will not.—*Exchange.*

HUMAN RELATIONS IN INDUSTRY*

Six De-Humanizing Elements on the Part of Capital and Six on the Part of Labor Are Treated—A Better Understanding, More of the Spirit of Conciliation Are Shown to Be Needed

By REV. JONES I. J. CORRIGAN, S.J.
Boston College, University Heights, Newton

I HAVE been pleased, as I visit the localities around Boston, to note the great interest that there is in those great social subjects that have such an important bearing on the happiness and the lives of all our people. There is an open mind, a desire to learn, or at least a desire to consider and discuss these great subjects. There is no subject of greater moment, or possessing more human interest than the one we are to discuss here.

WHAT IS INDUSTRY?

As we view the industrial life of the United States, the great mills and factories, the farms, the mind is staggered in contemplating the vast amount of money involved. From four hundred to five hundred billions of dollars are involved, and the annual return is from eighty to ninety billion dollars.

The romance of business is an attractive topic, but there is oftentimes tragedy in it, too. I talk on such a topic as "Human Relations in Industry" in the hope that, little by little, we can bring about better conditions in industrial relations and eliminate some of the tragedy that at times is found in industry.

Bettering the industrial relations is the objective of all true management; of all true trade unionism. Industry is made up of three factors, none of which can be eliminated. These are capital, management and labor. These three and their inter-relationships constitute the industrial relation.

Business cannot be run without money, capital. You cannot build and equip a factory without real machinery, hence the capital invested is the first element in the industrial relation.

The second element is management—"business brains." It is the human directive force in industry, the brains behind the concern. Management is absolutely necessary if business is to avoid bankruptcy. It is business brains that invest capital, that organize the industry, that run the industry and direct the operative force, that distribute the product, that gage the market and that avoid the two extremes of overproduction and underproduction.

Labor is the operative force without which capital is worthless and business brains cannot accomplish their task. Labor applies the power under the direction of management to yield the finished product.

Carnegie answered the question as to whether capital, management or labor is most important by asking another question: "Which leg of a three-legged stool is the most important?"

If you want to keep an industry successful you have got to keep capital prosperous, you have got to supply it with business brains of the highest possible type and you have got to have labor interested in the business and manifesting goodwill toward it.

The industrial relation is a human institution and ought to be kept human. Unfortunately, and this is the tragedy of industry, it is not kept human. There are de-humanizing elements working against the best interests of all concerned—on the capital-management side and on the labor side.

DE-HUMANIZING ELEMENTS ON THE CAPITAL-MANAGEMENT SIDE

Six de-humanizing elements on the side of capital and management, in our country especially, are as follows:

1. Intense concentration of wealth in the hands of the relatively few. Of wealth amounting to between four and five hundred billions of dollars most of it is in the hands of one-fifth of the population. But in this investor class three-quarters are only small investors, probably not more than 40,000 families being very large investors. The result is that the mass of the people are dependent upon their weekly wage. Thus we do not have economic freedom because of the concentrated conditions of wealth.

2. Lack of real, free, open competition. There is some competition but also a vast amount of monopoly. The people who hold the concentrated wealth own the big industries and shut out competition. This is illustrated in a small way by the growth of chain stores and their effect on the small business man. People buy where they can save a cent or two and the little fellow is pushed to the wall. Competition ceases, relative monopoly follows and the people who foolishly cut their own throats pay the price.

3. Autocratic control by a few over the lives of thousands. The power and wealth of a few people give them autocratic control of the big industries. Their workers must work for them or starve. They dictate what the worker shall eat, what he shall wear, his amusements, practically every phase of his life.

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*Abstract of address delivered at Transportation Department Group Conference, Jos. A. Griffin, chairman, Nov. 4, 1927.

4. The organization of industry for unlimited profits. Profit should be a fair return for one's contribution to industry and there can be no complaint against such. But there is such a thing as excessive profit, and business makes little distinction between the fair and unfair profit. I do not wish to exaggerate, for in our own country there are many business men who are socially minded. It would be a great injustice to include them with the soulless, heartless and emotionless, when it comes to a question of business. I am talking of the economically "hard boiled" element in business which does not see human relationships. Those are the fellows who are causing the de-humanizing trouble.

5. The exploitation of the worker. In some industries men, women and children are made to work for starvation wages under unhealthful conditions. Unless this condition is met it will cause industrial trouble. You cannot exploit humanity. You cannot, as Bryan so well said, "crucify mankind upon a cross of gold" and not expect trouble.

6. The monotonizing of the worker's life. Large-scale industry is so divided into particular processes that a man or woman is compelled to work on one little detail. This is a grave injustice and the worker is being stunted. The creative faculties cannot have free play if the worker's life is monotonized.

De-Humanizing Features on the Side of Labor

My sympathy is strongly with labor, because I realize that labor has not received a square deal in much of the industrial history of our country. Of course, I am excepting present company, because labor on the Boston Elevated Railway is receiving, I think, a pretty square deal. I shall mention six de-humanizing elements on the labor side:

1. A tendency to loaf on the job, especially since the war.

2. A tendency on the part of some workers to restrict output. It is a fallacious idea that restriction of output will make a job last longer. The wheels of industry cannot be stopped if we are to have prosperity. Limitation of output de-humanizes the man and the industry. If a man knows he is not on the square the whole industry suffers.

3. Careless workmanship, the loss of the worker's pride in his craft. A careless spirit has come, so that workers do not care whether their work is right, wrong or indifferent. Careless workmanship is costly, and results in waste and poor production. As a result legitimate profit is diminished.

4. A tendency to break contracts. A broken contract is broken faith. No one should sign a contract unless it is suitable and acceptable, but once it is signed it should stand fast, the faith should be kept. Industry requires faith. An employer may be tied up in a serious contract; grave injustice is done him when a labor contract is broken without justification. Labor is a sacred thing and its good name is very valuable.

5. Exorbitant demands on the part of labor, in the matter of wages, hours and conditions. The workers have a right to a full return for their contribution to industry. That is the true gage for a true wage. But when a demand is made for wages beyond all computation, when conditions and hours that are absurd are demanded, then the labor side is being de-humanized.

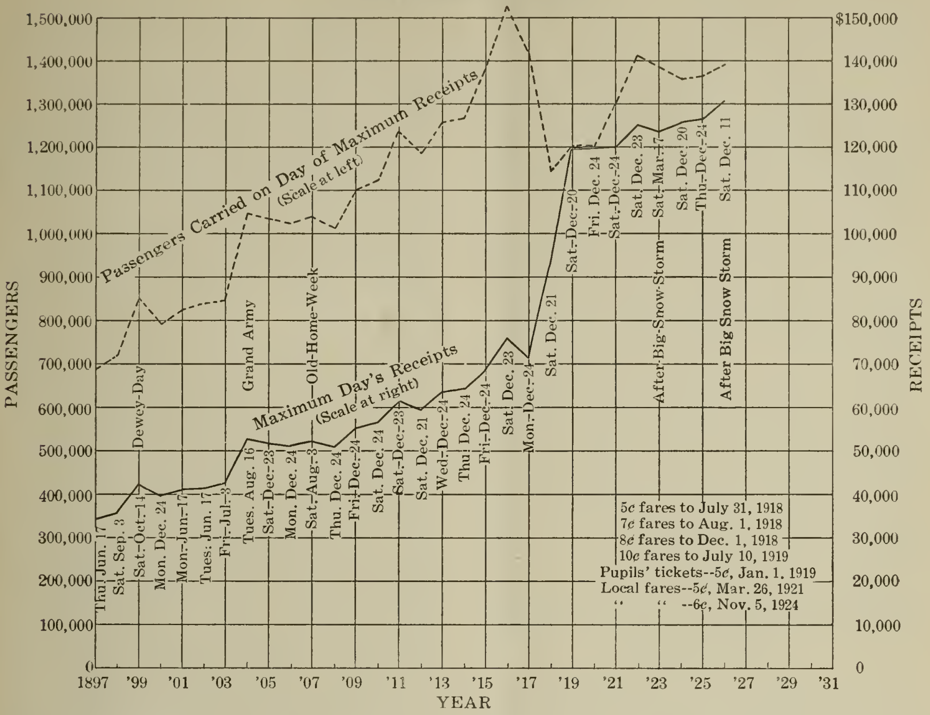
6. A belligerent attitude on the part of representatives of labor. Instead of a true, manly, conciliatory attitude there is often the "chip on the shoulder" attitude. Many representatives of unions have done the cause of unionism irreparable harm by their unreasonable attitude. The cause of unionism is too sacred a thing to be brought into disrepute by the ill-considered actions of a few unreasonable representatives.

Conclusions

The great Indian leader, Mahatma Gandhi, gave as the cause of the unrest in Western civilization: "Their god is gold." Was Gandhi right? Is that the reason why capital and management are de-humanized? Is that the reason why labor has not made the progress it should? It is a question whether Gandhi was right or not, but if industry makes gold its god it will never solve the industrial relationship.

Now a word to you men as transportation men. You must treat the public with consideration, courtesy and thoughtfulness if it is to be your friend. This is necessary even for your own selfish interests if for no other reason. The riding public of Boston is the true friend of this road and all concerned. Give it a fair deal. Thus can the worker do his part to humanize industrial relations. We need better understanding. We need more of the spirit of conciliation. We shall never have industrial peace by jangling the sword and rattling the sabre. Those things promote conflict. We need a truer spirit of goodwill all round. Then the de-humanizing elements that are stopping the wheels of industry will be gradually eliminated. Then industry instead of following the law of claw and tooth, the law of the savage, will follow the law of human relationships. Instead of being a man-killer as it has been under the law of de-humanized industry, industry will become what it is intended to be under the law of human relations, a man-builder. That will help toward peace, happiness and prosperity of all parties concerned.

LARGEST DAY'S RECEIPTS AND NUMBER OF PASSENGERS CARRIED ON DAY OF LARGEST RECEIPTS IN EACH CALENDAR YEAR



RECORD DAYS FOR THIRTY YEARS

The accompanying chart and table show the days of maximum receipts and the number of passengers carried on those days during the past three decades. The record for the period was broken on Saturday, Dec. 11, 1926, after the big snowstorm, when the revenue was more than $130,000.

It is interesting to note that these record-breaking revenue receipts came from 1,391,046 revenue passengers, whereas a greater number of passengers in 1916 produced under $76,000 and in 1917 only slightly more than $71,000. The fare increases which produced this result are shown in tabular form below the diagram.

As a rule it is the Christmas trade which produces the largest receipts. The day before Christmas is naturally the day of heaviest traffic unless that happens to be a Sunday or unless a large snowstorm or some civic event of great importance causes a shifting of the peak. During the thirty years twenty peaks are accounted for by the Christmas trade. Of the remaining ten, one-half were caused by great civic events or big

(Please turn to Page 172)

Record Receipts and Corresponding Revenue Passanger, Boston Elevated Railway

(The above graphs were platted from this table)

Year	Day		Receipts	Rev. Pass.
1897	Thu.	June 17	$34,140.71	682,814
1898	Sat.	Sept. 3	35,908.77	718,175
1899	Sat.	Oct. 14	42,428.12	848,562°
1900	Mon.	Dec. 14	39,512.93	790,258
1901	Mon.	June 17	41,191.09	823,821
1902	Tue.	June 17	41,917.91	838,358
1903	Fri.	July 3	42,177.80	843,556
1904	Tue.	Aug. 16	52,177.99	1,043.559*
1905	Sat.	Dec. 23	51,229.08	1,024,581
1906	Mon.	Dec. 24	50.754.05	1,015,081
1907	Sat.	Aug. 3	51,905.89	1,038,117†
1908	Thu.	Dec. 24	50,477.91	1,010,698
1909	Fri.	Dec. 24	54,860.43	1,098,321
1910	Sat.	Dec. 24	56,229.77	1,125,867
1911	Sat.	Dec. 23	61,491.69	1,230,914
1912	Sat.	Dec. 21	59,127.49	1,182,987
1913	Wed.	Dec. 24	62,933.50	1,259,413
1914	Thu.	Dec. 24	63,137.77	1,263,475
1915	Fri.	Dec. 24	68,533.96	1,371,509
1916	Sat.	Dec. 23	75,668.28	1,544,027
1917	Mon.	Dec. 24	71,364.90	1,428,457
1918	Sat.	Dec. 21	91,504.76	1,143,809
1919	Sat.	Dec. 20	119,254.52	1.200,386
1920	Fri.	Dec. 24	119,425.47	1,203,081
1921	Sat.	Dec. 24	119,549.34	1,305,508
1922	Sat.	Dec. 23	124,718.01	1,416,394
1923	Sat.	Mar. 17	122,730.21	1,388,297‡
1924	Sat.	Dec. 20	126,558.44	1,360,086
1925	Thu.	Dec. 24	127,264.45	1,363,302
1926	Sat.	Dec. 11	130,036.31	1,391,046‡

°Dewey Day.
*Grand Army
†Old Home Week
‡After Big Snow Storm.

snowstorms. The records of the Bureau of Audit show that even if Dec. 11, 1926, had not broken the record, the record for the thirty-year period would still have been broken in 1926, on Feb. 14, also after a big snowstorm. On that day the receipts were $128,754.71 and the number of revenue passengers, 1,376,723.

For the current year the record to Oct. 31, 1927, is held by Saturday, Feb. 5, when the revenue was $123,899.69. On that day 1,327,748 revenue passengers were carried.

A WELL-EXPRESSED TRIBUTE

The general manager recently received from a woman patron an expression of appreciation of the courtesy of a conductor on the Huntington avenue line. She wrote:

"This young man is alert, attentive, courteous and splendidly patient under the most trying traffic conditions. His cheerful manner is an inspiration to those who observe him at work."

The general manager commends this list of attributes as suggestive to all employees who are trying to render courteous service to the public.

SUPERVISORS' ASSOCIATION LAUNCHED

At an enthusiastic meeting held at Sullivan Square on Nov 16 an association was formally organized by men in supervisory positions for the purpose of promoting acquaintance. It will be known as the Boston Elevated Railway Supervisors' Association. The following were elected to the positions named:

President, J. M. Patten, rolling-stock and shops.

Vice-President, J. P. Banks, transportation.

Vice-president, E. L. Doyle, power.

Vice-president, Thos. Kivell, maintenance.

Secretary-treasurer, J. L. Troy.

The above form the Board of Control, together with the following, appointed by President Patten:

Member Board of Control, J. A. Smilley, rolling-stock and shops.

Member Board of Control, P. E. Maw, transportation.

Member Board of Control, W. H. Barnes, maintenance.

Member Board of Control, C. H. Dey, power.

The invited speaker at this meeting was E. Grosvenor Plowman, of the Associated Industries of Massachusetts, whose topic was "Management's Part in Maintaining Prosperity," the term management being used to cover the activities of all men in supervisory positions. His plea was for good craftsmanship in furnishing service as well as in the practical arts. He said that there is a strong movement towards this, particularly in Europe.

The formal part of the meeting was followed by the showing of a new Stone & Webster film, covering the development of the great Conowingo power project on the Susquehanna River.

It was decided that all eligible men who enroll for membership and qualify by paying the nominal dues on or before Jan. 19, 1928, will be rated as charter members.

After the meeting it was announced that the invited speaker for the Dec. 14 meeting will be Mr. Dana, general manager.

All men in supervisory positions are invited to attend this meeting and, if they so desire, to enroll as members.

CHRISTMAS SEAL SALE

The Boston Tuberculosis Association will soon begin its annual sale of Christmas seals to help in its work. This is to spread the knowledge of health throughout the schools, factories and stores of this community. Last year 14,000 school children were enrolled in the "modern health crusade." The Prendergast Preventorium of Mattapan gives free care to children who have been exposed to tuberculosis. Last year the association saved 178 children from probable blindness. The purchase of every single seal helps in the great service which this organization renders to the community.

REGARDING THE BOSTON ELEVATED "CLOSE-UPS"

In January, 1927, we began the publication, on the first page of "Co-operation," of intimate pictures showing typical Boston Elevated Railway employees at their jobs. The plan was to discontinue this series at the end of the year. The interest in the series has been so great, however, and there are other work jobs which really should be included in the series, that the "close-ups" will be continued until the middle of the year. Suggestions for "close-ups" for the remainder of the series will be welcome. Please address these to the general manager.

APHORISMS

There is nothing noble in being superior to some other man. The true nobility is in being superior to your previous self.—*Hindoo Sayings.*

The man whose personality we praise is the man who interests us.—*Thos. Dreier.*

WHY THE LAW?*

In First Lecture in Course in Everyday Law the Speaker Traced the History of the Law Back to Primeval Times and Showed How Modern Law Is Based Upon Principles Deduced From Experience of Ancient Peoples and Adapted to Modern Conditions

By HON. RUSSELL A. SEARS
General Claims Attorney, Boston Elevated Railway

IN opening this course of lectures I believe the first thing we should know is why there is any such thing as law.

In the first place, what is law? The one definition which has stood the test of time and technical criticism is this: "The law we have to do with is 'A rule of conduct prescribed by the supreme power in the state, commanding what shall be done or what shall not be done.'"

There are many kinds of laws, but the one that interests us most is the civil or political law, as above defined.

To understand how and why the law we must go back to the prehistoric days when men were little more than beasts. Living in a cave with a woman who was his companion, prehistoric man reared his family. Endowed by nature with greater strength, courage and endurance than his companion, he was looked up to as the head of his family. Thus he was the "supreme power" in that "state," its law-giver. Here we have the first form of government, the first kind of law. But men are social beings, so little by little the ancient cave-man began to associate with his fellows, perhaps for protection against the beasts, perhaps for the better collection of his food. When he had collected his food he resented attempts to take it away from him. He demonstrated his right to property and to defend that property.

Then as families increased in size, a "headman," usually the strongest in the tribe, ruled it as "the old man" or "patriarch."

For ages the patriarchal system continued, as illustrated by the Biblical records of Jacob and his twelve sons, each of whom founded a tribe of Israel. When these tribes came together they formed the Israelitish nation.

EARLY LAW IN EGYPT

As long ago as 3000 years B. C., Egypt, the birthplace of civilization, was the seat of a well-organized government, with law maintained by standing armies and administered by civil officers. Fortunately the Egyptians were prolific writers and left records which were preserved in inscriptions on monuments, tablets and temples. The laws were thus indelibly recorded. Many of these records, however, were undeciphered until about a century ago, when the famous Rosetta stone was dug up at the mouth of the Nile. As these inscriptions were duplicated in Greek and hieroglyphics they served as a key to the ancient inscriptions.

Through these inscriptions it was learned that in Egypt there was a court of thirty judges, with a chief justice, a clerk and the equivalent of modern court officers.

Their laws were recorded in eight books which were at the elbow of the judges presiding over the court. The Egyptian laws provided for severe punishment for perjury but justice to all, high or low.

THE LAW IN BABYLONIA AND ASSYRIA

Again, there existed in Assyria almost 5000 years ago an excellent system of laws introduced from Egypt. In this country, as in Egypt, the ruler had supreme power and was the law-maker. His word was law.

In 2250 B. C. Hammurabi was king of Babylonia. He formulated the code, still called by his name, which was a milestone in the history of law. The 320 sections of the code, all of which are still in existence, anticipated much of future law. He took the forward step of preserving the rights of property as well as those of persons. He was severe on criminals, but had sensible ideas as to the definition of property boundaries and descent in the event of the death of the owner.

LAW IN THE HOLY LAND

The great law-giver of the Israelites was Moses, who lived in Egypt during the early part of his life, and so was familiar with the laws of that land. The tradition is that Moses received his tables of law from the hand of God on the mountain. At any rate, he got the law across to the people. It is elaborated in the first five books of the Bible, particularly in Leviticus. Here there are minute laws as to everyday living, many of which are still followed by millions of people.

THE CONTRIBUTION OF GREECE

Not far from Palestine is Greece, the southern part in the early days being Sparta. Nine hundred years before the Christian era the Spartans were a strong, warlike and brave race. Their energies were devoted to the development of the body so that the men could become warriors. There were the strictest rules as to daily conduct. Weaklings were discarded. Sparta was governed under the laws of Lycurgus, who had drawn them at the behest of the Council of Elders, comprising twenty-eight old men. Lycurgus had such contempt for wealth that he ordered what coinage there was in Sparta to be made of iron so that men could not carry much around with them.

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*Abstract of first lecture in Course in Everyday Law, E. M. Brooks, chairman, delivered at Franklin Union and Sullivan square, Monday, Nov. 11, 1927.

In the north of Greece was Athens, which at its best developed the intellect to a state so high that it has never since been exceeded. The Athenians wanted a written law and, being familiar with that of the Spartans, they requested Draco, the Archon or ruler of Athens, to compile their laws. He drew up a code so severe, so cruel, so awful that it was said to have been written, not in ink but in blood. After a hundred years of Draco's laws the Athenians authorized Solon, also an Archon, to draw up another code. He humanized the severe laws of Draco. He went into minute detail in his code, with all the particularity that he could think of and anticipate. His splendid, forward, civilized code has been, more or less, the model of even our modern laws. About 250 years after Solon, i. e., about 500 B. C., when Greece was at the height of her glory, Pericles added a feature to the laws of Solon; he established juries. The juries were large, from two hundred to five hundred men, chosen by lot, and they received pay as jurors.

ROME LAYS BASIS FOR MODERN LAW

When Greece had reached its height, Rome was becoming a great city. Rome was becoming mistress of the world. Because she had so many colonies Rome was impelled to prepare a comprehensive system of laws. These laws today form the basis of the colonial laws of England and other countries, including our own.

In response to a popular demand a commission was sent from Rome to Athens to study the laws of Solon. After their return, they brought out, in 450 B. C., the Twelve Tables of Rome, which are the basis today of practically all fundamental laws of the civilzed world. This law was carried to England, where it remained after the Romans were driven out.

When William the Conqueror conquered England, in A. D. 1066, he brought with him the feudal system which modified the law which he found there. This comprised the sub-division of the land by the ruler into tracts which were given to nobles. The nobles subdivided their sections among "freemen," or, as we would say today, "gentlemen farmers." The freemen in turn parceled out the land among the serfs, the men who did the actual work. The king promised protection in times of peace and expected support in times of war.

The feudal system continued in England until 1215, when its abuse brought about a revolution and Magna Charta, or the Great Charter, was extorted from King John. This was the greatest single thing that ever happened to enable men to preserve their rights of person and property. Soon after, in 1246, a definite jury system was established in England, and in 1265 the English Parliament was formed about as it is today.

LAW IN THE AMERICAN COLONIES

The American colonies were settled largely from England, and the English law was naturally brought here. They liberalized the common law of England in the atmosphere of freedom. While the English king was represented in the colonies, this was practically only as a matter of title.

After this country had achieved its independence, the second great milestone in the history of the law was set up in 1784 in the Constitution of the United States, one of the most marvelous documents conceived by the mind of man or written by his hand. To the last word it expresses the right, freedom and liberty of mankind. Under the Constitution each state has made its own law. Since the Constitution was adopted the American people have put a humane spirit into their laws, making more forward progress in the last hundred years than had been made for six thousand years before. This could not have been done, perhaps, had we not profited by the experiences of the older countries.

LAWS OF THE FUTURE

Of course no man knows what the law of the future is going to be. As Patrick Henry said: "I know not how to judge the future except by the past." But, reasoning from the past, I can see a well-defined narrowing-down of special privilege, with an even greater equalizing than we have today among our people. This forward step will bring all the quicker the brotherhood of man and in every step that tends to that end mankind will be working out its expected destiny.

APHORISMS

A crank is a fellow who insists on convincing me, instead of letting me convince him.—*Aera.*

He who has conferred a kindness should be silent; he who has received one should speak of it.—*Seneca.*

The function of culture is not merely to train the powers of enjoyment, but first and supremely for helpful service.—*Bishop Potter.*

ELEVATED CLOSE-UPS

In the Bureau of Audit

(See illustration on front cover)

THE picture on the front cover of this issue was taken in one of the offices of the Bureau of Audit, and shows the chief clerk of the statistical department of revenue accounts, with some of the clerks in the background.

The Bureau of Audit requires a force of about 100 people, and is divided into four sub-divisions as follows: revenue accounts, department accounts, payroll auditing and general accounts.

In the department of revenue accounts the work involves the accounting for the fare from the time it is deposited in the farebox or passimeter until it is turned over to the treasury of the Railway.

During the year ending Dec. 31, 1926, this division of the Bureau accounted for 371,218,401 revenue fares, and a total revenue from passengers carried of $34,393,953.90. An interesting point in connection with this accounting is that on Nov. 5, 1927, the first day of the opening of the Dorchester rapid-transit extension, the revenue taken in at the prepayment stations of the system totalled 63.14 per cent and the revenue collected on cars and buses totalled 36.86 per cent of the total revenue for that day.

This division of the Bureau is responsible for the auditing of the sales of 6¼-cent tickets, pupils' tickets, and 10-cent government tickets, which last year amounted to $3,883,000. Here also is audited the revenue from special cars and buses, and coasting records are made up showing the per cent of coasting or "power-on time" for each operator or motorman. Various reports are prepared, such as car-miles, seat-miles and car-hours operated by cars and buses; car earnings and passenger statistics; and other statistical reports which are necessary for the operation of the Railway, and which are required for the annual return to the Department of Public Utilities. The destroying of all tickets and transfers comes under this division.

In the department accounts, the work involves a system of job-cost accounting for work done in the various shops and carhouses, in power stations, on track and line equipment, and in the various other branches of the operating departments. This branch of the Bureau is responsible for the accounting for all material delivered either on the job or in and out of the fifty-four stockrooms of the Railway, and for the checking and auditing of the inventories taken each year, which, at the close of business last year, amounted to about $2,100,000.

Card records of all track and line equipment in the twelve cities and towns in which we operate, also card records of cars and buses and other equipment, are kept up to date. Here also the bills are made up for sales of scrap and other material sold by the purchasing agent, and all bills for collection against outside firms.

This branch of the Bureau makes up the depreciation schedule for the monthly charge to operating expenses, and furnishes the operating departments with statements as to costs and expenses.

Another and important work in this department is the accounting of all charges to the road and equipment accounts for additions and betterments, which are made up in the most minute detail for inspection and approval by the Department of Public Utilities.

In the payroll auditing department the payrolls compiled by the operating departments and forwarded to the Bureau of Audit are checked against the original time-cards, extension is verified, and distributions of costs are made to the various accounts as prescribed by the classification of accounts.

Weekly comparative reports are made up showing the increase or decrease of the wage cost and number of employees in the various departments, as compared with the corresponding week of the previous year, and the wage cost per mile operated.

The total of wages paid for the year ending Dec. 31, 1926, was $17,697,377. A card record of the weekly wage of each employee is compiled for the purpose of making returns to the government and commonwealth, as required by the income tax law.

In the department of general accounts all bills against the Railway are audited for payment, and the general books of the Railway are kept. This branch of the Bureau has to do with the financial operations of the Railway, such as the accounting for interest and dividends, the accruing and paying of taxes of all sorts to the federal, state and municipal governments, the administration of insurance in all its various forms, as carried upon the property and operations of the Railway, the accruing and paying of tunnel and subway rentals, and the accruing of proper reserve to meet claims for accidents, etc.

The result of the work of this department finds its answer each month after the results of the operations have been determined; and the general manager broadcasts to all employees in the monthly bulletin the financial results for the month, and the present balance in the reserve fund.

CHANGES IN THE RESERVE FUND

Fiscal Year 1926-27

July 1, 1926. $1,000,000

July	$393,028.41*	Jan.	$186,947.50†
Aug.	451,546.79*	Feb.	92,018.37†
Sept.	236,543.80*	Mar.	256,586.83†
Oct.	2,723.19†	April	181,694 29†
Nov.	29,302.22†	May	113,284.72†
Dec.	234,879.91†	June	92,917.54*

Profit and loss credit..... ..$137,259.76

Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*
Aug.	$408,570.65*
Sept.	$147,204.65*
Oct.	$79,421.56†

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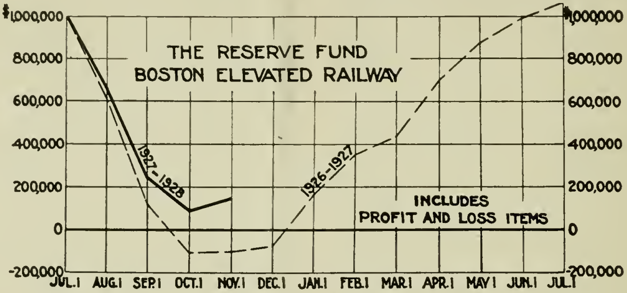
†Excess of revenue over cost of service.

*Excess of cost of service over revenue



OCTOBER OPERATION

GENERAL FINANCIAL DATA	1927	1926
Revenue exceeded cost of service	$79,421.56	$2,723.19
Operating revenue per car-hour (A.E.R.A. std.)	$6.34	$5.97
Operating revenue per car-mile operated	63.34c	61.27c
Average fare per revenue passenger	9.287c	9.263c
Ratio operating expense to operating revenue	70.30%	73.07%
PASSENGERS CARRIED		
Revenue passengers	30,664,756	31,423,943
Per cent 5c and 6c passengers	18.22%	17.83%
Revenue passengers per car-mile operated	6.580	6.412
OPERATING FACTS		
Trips operated	593,953	632,476
Car-miles operated:		
Rapid-transit lines	1,292,720	1,331,228
Surface, two-man	1,663,605	1,882,450
Surface, one-man	1,246,402	1,230,722
Newspaper and sprinkler cars	1,021	1,306
Motor bus	457,499	455,376
Total miles operated	4,661,247	4,901,082
ACCIDENT DATA		
Accidents per 10,000 car-miles	2.16*	2.29*
Accidents per 10,000 bus-miles	2.60*	3.54*
Revenue passengers carried per accident	17,560	17,020
Average number of witnesses per accident	3.11	3.32
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	16	10
Employees complained of by car riders	90	99
Car defects reported per 10,000 car-miles	3.2	3.7
INFORMATION ABOUT POWER		
D.c. kw.-hr. output gross per month	17,202,840	18,665,390
Maximum kw. load	59,020	69,020
Tons of coal consumed	14,844	16,262
Lbs. of coal burned per d.c. kw.-hr. at cars	2.029	2.060
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	1.15c	1.10c
Per revenue car-mile	4.26c	4.22c
Kw.-hr. per revenue car-mile	3.618	3.843

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*This does not include miscellaneous accidents or derailments.

Nov. 21, 1927. EDWARD DANA, *General Manager.*

ALLIED PRINTING TRADES UNION LABEL COUNCIL BOSTON

CHANGES IN THE RESERVE FUND

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	**$393,028.41***	Jan.	$186,947.50†
Aug.	**451,546.79***	Feb.	92,018.37†
Sept.	**236,543.80***	Mar.	256,586.83†
Oct.	2,723.19†	April	181,694 29†
Nov.	29.302.22†	May	113,284.72†
Dec.	234.879.91†	June	92,917.54*

Profit and loss credit..... ..$137,259.76

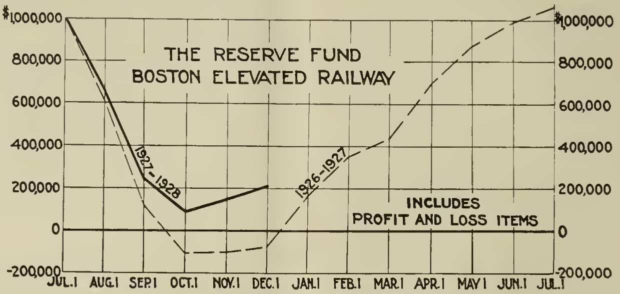
Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*
Aug.	$408,570.65*
Sept.	$147,204.65*
Oct.	$79,421.56†
Nov.	34,226.52†

†Excess of revenue over cost of service.

*Excess of cost of service over revenue



NOVEMBER OPERATION

GENERAL FINANCIAL DATA	1927	1926
Revenue exceeded cost of service	$34,226.52	$29,302.22
Operating revenue per car-hour (A.E.R.A. std.)	$6.22	$6.06
Operating revenue per car-mile operated	61.52c	62.06c
Average fare per revenue passenger	9.29c	9.259c
Ratio operating expense to operating revenue	70.82%	71.97%
PASSENGERS CARRIED		
Revenue passengers	30,745.503	31,694,487
Per cent 5c and 6c passengers	18.04%	17.99%
Revenue passengers per car-mile operated	6.409	6.501
OPERATING FACTS		
Trips operated	606,609	628,592
Car-miles operated:		
Rapid-transit lines	1,395,203	1,304,952
Surface, two-man	1,689,532	1,894,907
Surface, one-man	1,256,871	1,228,751
Newspaper and sprinkler cars		550
Motor bus	455,195	445,850
Total miles operated	4,796,801	4,875,010
ACCIDENT DATA		
Accidents per 10,000 car-miles	2.77*	2.12*
Accidents per 10,000 bus-miles	2.14*	3.29*
Revenue passengers carried per accident	16,950	17,700
Average number of witnesses per accident	3.5	3.3
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	22	22
Employees complained of by car riders	100	100
Car defects reported per 10,000 car-miles	4.6	4.1
INFORMATION ABOUT POWER		
D.c. kw.-hr. output gross per month	20,662,505	22,194,650
Maximum kw. load	75,020	78,200
Tons of coal consumed for power	17,310	18,896
Lbs. of coal for power per d.c. kw.-hr. at cars	1.882	1.912
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	0.96c	0.96c
Per revenue car-mile	4.16c	4.45c
Kw.-hr. per revenue car-mile	4.341	4.630

*Does not include miscellaneous accidents or derailments.

Dec. 20, 1927 EDWARD DANA, *General Manager.*

ELEVATED CLOSE-UPS

The Conductor-Operator

(See illustration on front cover)

CONDUCTORS and operators meet passengers as they board and leave the cars and look after their comfort and safety while upon the cars. They come in contact daily with a very large majority of the million or more revenue passengers carried each day.

All employees represent the Railway while on duty, but the conductor or operator is essentially the Railway on duty in uniform upon the cars.

The work of the conductor or conductor-operator requires him so to operate his door as to insure the safety of passengers boarding and leaving the car. He sees that passengers deposit cash fare in fare boxes or he collects tickets and transfers in accordance with regulations, after which he makes proper return thereof. He attends to the needs of passengers while the car is en route; keeps order upon the car; gives information upon request, gets the good-will of passengers and retains it.

In case of trouble, blockade or accident he performs additional duties. He assists passengers to continue their journey. He safeguards the interests of passengers and of the railway at all times. He makes a full report of the occurrence, and protects himself and the Railway by securing proper witnesses.

There were in service on Dec. 1, 1927, 2,385 operators and 490 conductors, a total of 2,875.

TROLLEY CARS NOT OBSOLETE

In his editorial column in the daily papers Arthur Brisbane, the famous editor, recently commented on a Reno news item thus:

"The state of Nevada is progressive. Night before last, at Reno, the remaining street car in the state rolled into the barn to be scrapped. Surface cars vanish from Nevada, with motor buses taking their place. Big cities in the East, West and Middle West take notice."

This was quoted in an advertisement in Printers' Ink, Oct. 3, 1927, and the following information was given:

There were never more than ten street cars operated in the entire state of Nevada.

In Reno the average traffic was under 3.000 passengers daily, whereas on the Chicago surface lines more than four million passengers are carried daily, in Los Angeles and Cleveland over a million each, in Detroit, 1,250,000 and in Philadelphia 2,500,000. (In Boston the daily average for 1926 was over 1,000,000.)

The total number of street cars discontinued throughout the United States since 1919 is less than the increase for Los Angeles.

WHAT DO YOU KNOW ABOUT THE "EL"?

Here are several additional questions in the series that have been appearing in recent issues of "Co-operation." Such questions are valuable in checking the accuracy of our information and in impelling us to consult sources of facts.

The answers to these questions will appear in next issue of "Co-operation."

66. As of December 31, 1926, what was the permanent investment in the "El" per dollar of annual total income?

67. Of the nearly four million dollars advanced to the "El" by cities and towns in 1919 how much had been repaid, to and including July, 1926?

68. To and including 1926, how much money did the City of Boston invest in the "El"?

69. How many new blue-uniformed men were employed by the Railway in 1926.

70. What is the estimate of cost of the new Ashmont Station, inclusive of real estate, but exclusive of equipment?

Here is a picture of a train of new Cambridge subway cars ready to pull out of the new Fields Corner Station.

1897 a modern factory could make the same amount with only 12 hours of labor.

Of course, while the labor cost of manufacture has been reduced, the cost of buildings, machinery, organization, selling, and the like, has been greatly increased, so that the economy of the new methods is not so great as may at first appear.

And yet, modern machinery and methods have greatly reduced the cost of production of all manufactured goods, with the result that many things have been brought within reach of people of small incomes, which, formerly, only the rich could afford to buy.

APHORISMS

No man ever pushed himself forward by patting himself on the back.—*Commonwealther.*

The darn fool didn't know the thing couldn't be done so he went ahead and did it.—*Commonwealther.*

It is easier to prevent an accident than to explain about it afterwards.—*Commonwealther.*

One index of a man's value is his ability to work without supervision.—*The Log.*

THIRD MEETING OF SUPERVISORS' ASSOCIATION

Mr. Dana was the speaker at the third meeting of the Boston Elevated Railway Supervisors' Association held on Dec. 14, J. M. Patten, president, presiding. Mr. Dana's talk is abstracted elsewhere in this issue.

The entertainment program comprised accordeon selections by Michael Maffuchi, janitor Div. 3, and Carmon DeMorey. Oscar White, of the pattern shop, sang acceptably and led some chorus singing with Paul Holzman at the piano. Tom Hogan, operator Div. 3, told a string of stories in inimitable style. An unusually funny film, "From Hoboken to Hollywood," concluded the program.

The secretary received annual dues from more than two hundred of the men present, the total number being estimated at about three hundred. The next meeting is scheduled for Wednesday, Jan. 18, up to which time accepted applicants will be enrolled as charter members.

The officers of the Supervisors' Association call attention to the fact that membership is open to any man in a supervisory position, including Railway officials. For enrollment forms and information apply to Secretary J. L. Troy, safety assistant, Instruction School, Sullivan Square.

MR. DANA'S ADDRESS

(Concluded from Page 187)

coming altogether too frequent of late, and then went on to say, following out that thought, that these delays must not become a fixed habit. After getting the facts, I wrote an explanation of the facts and some days later, in another editorial, the paper explained that it had been in error, as shown by a brief letter from the manager of the road elicited by what had been printed previously. This letter had shown that the 20-minute delays for November, 1927, numbered thirty-four as compared with fifty-one for November, 1926. Due credit, said the editor, should be given for so marked a reduction.

This contact was between executives, but the contacts of the supervisory force with the public often permit an immediate answer. How many people in the interim between that original editorial statement and the later one believed that our delays were worse than they had been for a long time? How many failed to see the later editorial? How many people, influenced by that sort of statement, do not use our service, when it really would be for their advantage, but instead use a taxicab, walk, or jump on somebody's car and ride?

In this intensified age of struggle we must meet all sorts of conditions. In meeting them we must all help. We are all selling service, and we all want the good will of the public. In getting that good will each one of us can assist.

CAR PAINTING

The criticism has been made that we do not paint our cars as frequently as some other roads. Possibly on those roads the density of traffic gave them revenue enough to do this. We should like to get enough out of our budget to paint more cars, but we have all sorts of calls upon our budget, and at times we have to economize here and there. We have had three or four snowy winters; snow removal has piled up a heavy bill against us. We are doing all we can in different directions, but there has never been a year when we would not have liked to do more painting than we have been able to do.

In closing, I wish to reiterate a few of the things I would like to have you take to heart. Get acquainted, really acquainted, so that you know something about each other's respective individual personalities and thoughts, what the work of the other man is, what he is doing, and why. If you will plough that field intensively and earnestly, you will be doing more than you realize to lay strong and permanent foundations for this association, for which I see a very fine future.

All other industries are secondary, such as manufacture, commerce and transportation, because they begin where the primary industries leave off. Yet they are none the less necessary, for almost all the products of the primary industries require some manufacture before they become finished products, ready for consumption.

The primary industries take the first steps in industry, by supplying fish and game for the merchant, cattle and sheep for the packer, wheat for the miller, cotton and wool for the textile manufacturer, lumber for the sawmill, crude oil for the refinery, ore for the smelter.

Thus, nowadays, industry goes by a series of steps or stages, as products move from the primary producer to the final consumer.

For example, the farmer's wheat goes to the elevator, the railway, the mill, the bakery, the retail shop, and, possibly, back to the farmer in the form of bread.

And so with all raw materials: they travel from one set of producers to another, and often complete the circle by coming back to the primary producer in the form of finished goods.

Farmers and other primary producers are apt to regard themselves as the most important of all producers; and in a sense they are, because they start the ball rolling.

Also, the country could, if necessary, get along without the city, by manufacturing everything at home, as our pioneers used to do; whereas the city could not exist without the country.

But, unless the farmer is willing to go back to the more primitive stage of household industry, he cannot get along without manufacturers, merchants, railways, and other agencies of production. Even commission merchants are useful and necessary to him, so long as he cannot do his own marketing.

One of the most important results of all this specialization and division of labor is that the primary industries produce a vast surplus of raw materials, so that a larger proportion of our people live in towns and cities than ever before, and in their turn create a surplus of finished goods and services, in which all producers share.

In the year 1790, no less than 96.7 per cent of the people of the United States lived in the country or in towns of less than 8,000 inhabitants. But in the year 1920, only 48.6 per cent were living in the country or in towns of less than 2,500 inhabitants.

And when we allow for the fact that most of the people of the small towns are engaged in secondary industries, we find that less than 30 per cent of the people of the United States are engaged in agriculture and other primary industries.

MANUFACTURE

Before the Industrial Revolution, practically all manufacturing was done by hand, with the help of tools and simple machines. But nowaday almost everything is factory-made, and the workers use improved tools, machine-tools, and complicated, often automatic, machines.

We have only to look about the house to see that almost everything we use is made or prepared in this way: stone, brick, lumber, furniture, carpets, table linen, clothes, stoves, cutlery, books, newspapers, meat, bread, coal and a host of minor articles, down to pins and needles.

In fact, the ordinary home contains very few handmade articles: possibly, a painting or two, some embroidery or knitwork, a patchwork quilt, a few pieces of lace, some jars of preserved fruit.

The rich, on the other hand, like to have as many hand-made things as possible, which are now expensive and fashionable.

So the Industrial Revolution has brought about a revolution in consumption as well as in production, for machine-made things have displaced the hand-made things which formerly everybody had and used.

Machine-made things are cheaper and often better than the products of the old craftsmen and household workers, because of the superiority of modern tools and machines, the improved organization of factories, and much specialization and division of labor.

According to Adam Smith, author of "The Wealth of Nations" (1776), a single worker could make only a few pins in a day, whereas 10 workers, each doing a special part of the work, could turn out 4,800 pins per head per day.

But nowadays, by the aid of automatic machines, often tended by relatively unskilled workers, the daily output per worker is about 15,000,000 pins, all stuck in paper.

Similar, if less striking, improvements have been made in other lines of manufacture, and are still going on.

A shoemaker, in 1860, could make 10 pairs of men's fine calf shoes in 222 hours of work; but in 1895 a shoe factory could do the same amount of work with 30 hours of labor. That is, the productivity of labor in this industry, by modern machinery and methods, had been increased sevenfold.

Watch-cases, which in 1850 required 175 hours of hand-labor, required only 36 hours in 1897—a fourfold increase in productivity in that time.

In 1866 it required 125 hours of labor to make 100 pounds of butter; but in

EVERYDAY ECONOMICS—IV

This is a continuation, from the October issue, of the series of articles by Dean J. E. LeRossignol, Ph.D., L.L.D., of the College of Business Administration, University of Nebraska. He puts the subject into form easy to read and understand.*

THE ORGANIZATION OF THE BUSINESS WORLD

WHEN we look within the business world to see its construction and how it works, we find an elaborate organization of persons associated for individual and common ends, somewhat like the organization of an army, a church, or a political party.

The guiding spirits of the industrial army are business men of one kind or another: some carrying on small concerns of their own; some associated with one or more partners; others directors or managers of business corporations, large and small.

Most of our farmers are individual proprietors or enterprisers: owning or leasing their farms; owning more or less of cattle, horses, machinery, and other capital; employing relatively little labor, and, with the help of their families, doing most of their own work.

Most of our merchants and manufacturers and many artisans are small proprietors of this type, carrying on general stores, specialty stores, groceries, blacksmith shops, repair shops, and even mills and factories.

This type of business has various advantages, including simplicity, independence, and unity of control. But, as the business grows, the individual proprietor is apt to take one or more partners, for the sake of obtaining more capital, for the sharing of risk and responsibility, or for other reasons.

However, the partnership has some disadvantages, as when the partners quarrel or one partner incurs debts for which the other is liable.

So a large and increasing number of business concerns are now organized as corporations, with limited liability, permitting of ownership by a large number of stockholders, and management by a board of directors and salaried employees. Limited liability, as provided by the charter of a modern business corporation, permits an investor to hold stock without being liable for more than the amount subscribed, or, in the case of banks, for twice that amount.

This style of organization is very common in manufacturing, in which the number and size of corporations has increased rapidly in recent years.

According to the United States Census, in the year 1904 there were 51,097 manufacturing corporations, producing goods valued at $11,000,000,000, or 73.7 per cent of the total national product; whereas, in 1919, there were 91,517 corporations, producing goods valued at $54,000,000,000, or 87.7 per cent of the whole.

In the same time the number of individual manufacturers increased from 113,946 to 138,112, but their relative output decreased from 11.5 per cent to 5.7 per cent of the whole.

Evidently, the corporation is playing a larger and larger part in the work of the business world.

Naturally, every business concern has its own internal organization: sometimes very simple, as with most individual proprietors; sometimes very complicated, as in the case of great corporations like the United States Steel Corporation or the Western Union Telegraph Company.

And when we consider the relationship of all these business concerns to one another, with all the people and things involved, we see that there is an almost infinite number of connections, interwoven like the warp and woof of an oriental carpet or the tissue of the human body.

Everybody is connected with everybody else through the exchange of goods and services; a network of roads, railways, telegraph and telephone lines covers the country; people, goods and messages go to and fro; property and contract, debts and credits unite people of every name and place; and we are all bound together as parts of a great moving, growing and living whole.

THE PRIMARY INDUSTRIES

The primary industries, such as hunting and fishing, herding, agriculture, lumbering, and mining, are those which are closest to nature and come first in order of production in that they supply the raw materials for manufacture.

They supply, also, some few products ready for cooking, if not for immediate consumption, such as vegetables, fruits, and fishes, but these are of minor importance.

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1. **Don't be egotistical.** Nobody can afford to be egotistical. The greatest minds are not egotistical, and results show it. Some of the greatest things are done by the humblest men on earth.

2. **Don't be a demagogue.** A man should be willing to fit into a scheme and take his chances of getting on without asking anybody to intercede for him.

3. **Appreciate your own limitations.** That I have already emphasized.

4. **Be tolerant.**

5. **Don't know it all.** Nobody ever has yet.

6. **Think and plan.**

This organization, composed of men anxious to carry out the spirit which created it, "getting acquainted," can be of tremendous influence in rendering service to a million and a half people. I hope that you will not allow your gatherings to become stereotyped. Keep them stirred up, boiling, with chemical action in them, or else drop them. Express yourselves. Get what you want out of the association.

I think I may express, for the trustees' management, appreciation of the character of the work you have done for the past two years, largely through the team work so many of you have developed. Just as at South Boston we could not develop as many kilowatts as we do were it not for the large generating units, so without such co-operation as is shown by a voluntary association like this, each having his own ideas and each interested in and working for the success of the whole organization, we could not carry on our work and solve our problems as well as we do.

THE PROBLEMS OF 1928

Nineteen hundred and twenty-eight is going to present serious problems to the operating force of this railway, and the problems will be very heavy and serious ones. But that does not worry us; we have successfully faced difficulties before. We must and should always have problems to meet. It is a good thing for us to have difficulties confronting us. We are going to take pride and pleasure, and are to show zeal in tackling these problems, just as a football team, having won its victory, is looking forward with fervor to the next game.

Among the outstanding problems of 1928 is the accident problem. The accident account has been the one item in operating expenses this year that has increased. The increase was $216,000 for the first 11 months of 1927. This required that the other items of the budget had to be worked out to carry such an increase. A careful study indicated that there are ways and means of meeting that problem, and we are going to get results. We are going at the accident problem in a fair and intelligent way, trying to determine the causes of accidents and not taking it out of a man when his record has been good up to a certain point.

I believe in this method, and I know that our supervisory organization is willing to put its shoulder to anything that I do believe in, if I can show a good reason for it. I believe in it in principle, and I believe that from the operating standpoint it will help lighten our burdens, and simplify our problems.

While accident expense has increased it is encouraging to note that the November, 1927, returns just received, show an excess of receipts over expenditures of $34,000 as compared with $29,000 for last year, notwithstanding there was a loss of $74,000 in revenue. That shows what you have been doing, and the management appreciates the co-operation and team work which has been developed and is going to be developed to an even greater degree through an organization such as this.

SELLING SERVICE

Another fact of importance to us is that we are rendering service and selling service. Business does not just "grow up," like Topsy, or come to us, as it used to. We are serving at the present moment 6,000 to 8,000 people less a day than we did last year. With the increasing use of automobiles, we are bound to suffer a potential loss of traffic. People come to us because they want our service. It is our job to train the public to use our service because they like it. You cannot "sandbag" people into using the service. But if every supervisory unit will stimulate interest in the other units, so that people will be induced to use our service because it helps them in getting about, and if they can be shown that it is really for their interest to use our service, business will gravitate to us. If that is kept up over a long period we will get somewhere. People must be shown that our service is regular and efficient, and that it is the best thing to meet their requirements. We must sell service just the same as a man on the corner with a banana stand, or a man running a drug store has to sell his goods.

But sometimes people who talk of selling service overplay their hand, trying to build up business where no possibilities of traffic exist. We hear a good deal of complaint about our road that is not just. People say, "You talk about selling service, and yet we cannot get into a subway station after such and such a time." They fail to realize that a line must be drawn somewhere.

PEOPLE WANT THE FACTS

A few weeks ago a Boston newspaper stated that tie-ups on the "El" were be-

(Please turn to page 190)

developed to the point of producing results.

You have been thoroughly schooled in recent years, in the educational courses, in the characteristics necessary for success as key men. You are profiting by that, and this meeting is plain evidence that the work started five years ago has proven itself to be well worth while and should be continued. Don't you feel more enthusiastic today about your team and its problems and prospects than you did say five years ago? If not, you have wasted your time and others' time.

"GET ACQUAINTED"

An organization such as this must, of course, creep before it crawls, and crawl before it walks. But your very first problem, and one that should not be obscured by any other, is the one exemplified by your slogan, "Get acquainted." There is a great deal in these words. But by getting acquainted I don't mean merely shaking hands, introducing yourself and making a casual remark or two. It means to associate among the members of this association until you know them as human units, until you know some of the things that they are thinking of behind the scenes. Know each one as a real fellow worker. Of course, every one of us has his good points and his bad points, but you should know the individual for his real worth, you should make friends with him. He may be in a department far removed from yours. He may have no intimate knowledge of the things which you have to do. But general knowledge, among all, of the things that all have to do means a general friendly and intimate understanding and co-operation. Through such knowledge we can get down to real contacts that mean understanding. Such things are very important in an organization like this.

HOW EXECUTIVES CO-OPERATE

You all know how Messrs. Barnum, Moran, Sears, Wilson and I with my department heads are trying to think and co-operate for the solution of the problems of this road. We executives know each other as human units. That is what you can do in this association, and when you know each of your fellows, and something about the work he is doing you will have not only the foundation for better service as a team, but you will get a new wealth of pleasure and satisfaction.

I want to re-emphasize some things which I have stated before and which epitomize the problem we have as a supervising force. One is that the foreman must be a thinker. Success for the individual in the handling of everyday problems comes to the man who thinks continually; to the man who cares to recognize his own limitations. The man who does not care to recognize his own limitations is no good to himself or to others.

THE FOREMAN AS A THINKER

A good foreman is one who thinks for himself. Just because rules are laid down is no reason why, after careful analysis, they should be blindly followed. It has always seemed to me that it might be possible to develop human co-operation to such an extent that rules might become more and more useless, and judgment might rule. There would seem to be no reason why, with greater and greater efficiency, rules cannot be intelligently made on the spot to meet the situation, thereby facilitating the practical working out of problems. That may be a long way ahead, but it would seem that there are great possibilities for the future along this line. And all this has an important bearing on the standard of living, on the level of wages. Many industries are working toward improvement in these lines, toward efficiency that will have these results among others.

The thinker usually has enthusiasm, which creates the will to do as well as a tolerant attitude towards others. A foreman who cannot see both sides of a question is, in mechanical terms, eccentric. There are uses for eccentrics, but not in the foreman's mental equipment. Prejudice, also, has no place in any man's life, including that of the foreman who is supposed to think.

The foreman who thinks, who has enthusiasm and the will to do, who takes his tasks as if they were his own business, is bound by sheer weight of ability to "get there," to produce results, even though they may not be apparent for a long time. The foreman who has qualified for his job will take sufficient time by himself, away from the daily routine, to analyze and perfect his own knowledge as well as the knowledge of the men over whom he has supervision. No job is too important or too humble to make it unnecessary to study every detail.

These are facts which we should all take to our hearts.

SIX SIMPLE RULES

Some time ago I set down some of the ideas which are valuable for foremen and executives in the form made famous by the great football coach, Walter Camp. It would be well for any man to ask himself whether this or that, as stated here, applies to him. If he would set down against each of these suggestions a mark to indicate that he fails here or there, or that he might work to improve himself here or there, the result would be the same as that from taking a physical examination and sizing oneself up in that respect every year, as an increasing number of people are doing. The items are as follows:

A SUPERVISOR'S DUTIES AND PROBLEMS*

Before Three Hundred Men Occupying Supervisory Positions with the Railway, the General Manager Outlined the Aims of an Association of Supervisors and Suggested Ways in Which They Can Help Solve the Problems of Management

By EDWARD DANA
General Manager Boston Elevated Railway

THIS large gathering of men in supervisory positions is here on your own volition; you are here because we are engaged in service to our fellow citizens and you are personally interested in the problems with which we have to deal. During eight hours or more each day we have the opportunity to throw ourselves unstintedly into a public service and work together with our fellows for the common good of those whom we serve.

As I have said often before, there is an analogy in our work with modern sport; with the football team, the baseball team, the rowing crew. These sports reign supreme because they afford an opportunity for the individual to get away from himself and to cooperate with other human beings for victory for the team. The consciousness of team play grips us and thrills us to excel and help our team mates to excel.

This Supervisors' Association has great opportunities for constructive work. I am proud that you have seen fit to band yourselves together in this way. Your meetings bespeak the vital interest that has grown up among the men of the organization during the nine years of trustee control, an interest due to a desire to know more and to do more for the Railway. This interest has grown in spite of the seeming oppression by burdens, and your efforts have helped to bring about a financial result for 1927 which is much better than that for 1926. In planning for the future of the Association, why not raise it to the level of its possibilities? Let everyone throw himself into the spirit of it, be a part of it, help develop it and himself. Let no man or group of men use it, or allow others to use it, for self-aggrandizement or any ulterior motives.

Supervisors are Key Men

Key men you are, men upon whom falls the responsibility of interpreting the aims, plans and directions of the management. Upon the success with which you perform this task a great deal depends.

Do you ever stop to realize the responsibilities and opportunities of this position you occupy; how much depends upon you, or do you simply feel at the end of the day's work that you have done well, have performed good and faithful service, in attending to the work laid down for you?

The management tries to help you. It sometimes fails, due to lack of the true perspective, and sometimes part of the facts. Seldom does an executive have the advantage of real, constructive action or suggestion as to procedure and methods of getting results which can come, and I confidently feel in the future will come, from the brains of an organization like this.

Does your silence at times mean that you are entirely in accord wtih the solution of the managerial problems that the management settles or tries to settle? I cannot believe that in the minds of four or five hundred key men there are not lurking many ideas which, if worked out and talked over with the executives, would greatly increase the efficiency of our system. There I look for the fruits of such a voluntary organization like yours.

Pinchhitters in Demand

But weak is the man who believes he has helpful suggestions and fears to put them forward, and weaker still is the man who has them and uses them only to criticize any of his intimate associates. In baseball the pinchhitter is selected because he "can deliver," because he can do the job, not because he knows how to go through the motions of batting and attempting to hit the ball.

Where would a business organization get—ours or any other—if its executives and department heads were not in intimate relationship as regards the business problems with which they had to deal, able to discuss and argue the vital problems and necessary expenditures involved in the business in a friendly way? By so doing they arrive at solutions of the problems in which they jointly have a responsibility.

If this is true of executives and department heads, it applies with equal force to the key men. Because of their intimate contact with, and knowledge of, details even greater results can be forthcoming when such cooperation has been are thirty-seven committees at present. A committee advertises and holds a hearing on a bill, and afterwards may "report" a bill or may decide it "ought not to pass." If "reported" it has its "first reading" by title. If a bill involves expenditure of money it automatically goes to the Committee on Ways and Means, which holds a second hearing. If it affects a county it goes to the Committee on Counties and comes back with its report.

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*Abstract of address at third meeting of Boston Elevated Railway Supervisors' Association, J. M. Patten, president, Sullivan Square, Dec. 14, 1927.

The House and Senate each have calendars for a day's program, containing a list of bills to be considered, with the reports of the comimttees thereon. Bills are ordered by vote to a second or third reading or otherwise, usually following the recommendation of the committee concerned. Every bill ordered to a third reading automatically goes to a Committee on Bills in the Third Reading, which sees that it is in proper form. The House and the Senate each have trained lawyers to pass upon the form of bills, and to see that they harmonize in phraseology with existing laws. The committee may improve the phraseology, but may not change the substance of a bill, except with the concurrence of the House or Senate. The practice of having trained counsel for the House and Senate dates back only six or seven years.

The bill then comes up for final action by the House, and if approved is "passed to be engrossed." It then goes to the other branch of the Legislature, where it goes through the same stages. After this action by both houses it goes to the Secretary of State for engrossment. After being put into final shape in his office (now typewritten in script resembling handwriting on durable paper), it has yet to go back to the House and Senate for final enactment, usually given as a matter of form.

Next the bill goes to the Governor, who may sign it, veto it, or send it back to the Legislature with amendments which, if acceptable, will render the bill satisfactory to him for signing. The Governor has five days in which to sign or veto a bill after its presentation to him from the Legislature. A two-thirds vote of both houses is required to pass it over his veto.

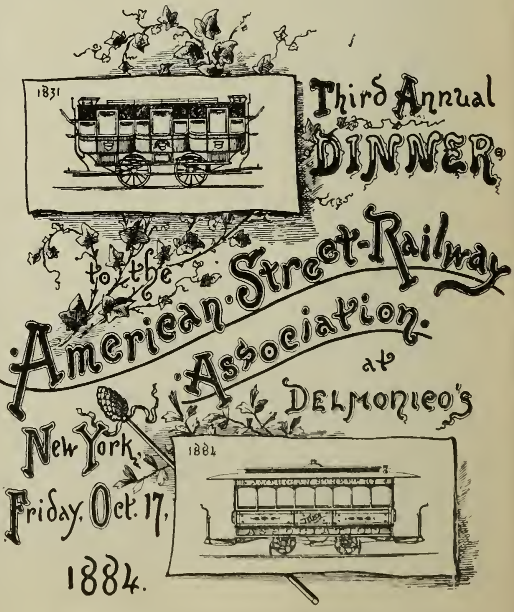
Legislation by Initiative

In 1918 an alternative method of legislation was adopted in this state by which ten citizens can file a petition for legislation with the Secretary of State, secure a form, draw up their bill and file it. If the Attorney General certifies the bill to be in proper form, a period of three months is allowed for the securing of 20,000 signatures if a change in law is sought. For a proposed constitutional amendment 25,000 additional signatures are required. The constitution prescribes certain matters which are not proper subjects for initiative. As a practical matter it is difficult to initiate changes in the law by this method.

This is not true of the referendum, adopted also in 1918, by which any law passed by the Legislature may be subjected to popular vote. Ten voters may file a petition for referendum with the Secretary of State. They are given a form to fill out and have ninety days in which to secure 15,000 signatures. If they succeed, the operation of the law is suspended and it goes upon the ballot at the next election. Several such matters are upon the ballot at nearly every election.

IN HORSE-CAR DAYS

Here is a small-scale reproduction of the cover of the menu card for an early dinner of the American Street Railway Association, later the American Street and Interurban Railway Association, and now the American Electric Railway Association. The changes in name obviously record the development of the industry represented by this association. The annual dinner was formerly the event of the year in the street railway industry. It was abandoned years ago. The illustrations on the menu card indicate that the types of vehicles used in 1831 and 1884 had many points in common. It is a long way from the 1884 horse car to the latest type of steel Cambridge subway or elevated car of the Boston Elevated Railway.



A SOUVENIR OF EARLIER DAYS

INTERESTING FACTS ABOUT LEGISLATION*

Following the Lecture by Mr. Sears on "Why the Law?" the Second Speaker in the Course in Everyday Law Continued the Story of the Law and Described Procedure in Framing and Voting upon Legislative Bills

By H. WARE BARNUM, ESQ.
General Counsel, Boston Elevated Railway

IN our law there are various classifications, such as civil law and criminal law, common law and statute law. Statute law is the result of legislation, the topic now under discussion. Common law is founded upon custom; statute law has been passed by various law-making bodies. Common law is based on decisions of courts and judges dating back, as far as we are concerned, to about 1200, and then for a long period collected in "Year Books." Our common law is based on the customary law of England which existed at the time of the War of the Revolution.

Most of the laws passed by our Legislature relate to matters of government; very few affect the rights of individuals among themselves. At times the Legislature steps in to codify existing law and make it accessible to the public. Also it amends law which has been laid down by the judges, when such law does not meet with the approval of the people.

SOURCES OF COMMON LAW

Referring to the early development of the law, as traced by Mr. Sears,† it is significant to note that the people of England reverted to paganism after the Romans were driven out with their highly developed legal system. About 449 A.D., the Angles and Saxons, although far behind the Romans in civilization, brought with them a more popular form of government. Their people were governed by meetings of the freemen of the villages, presided over by "ealdormen," the forerunners of our aldermen.

The Anglo-Saxons held a criminal's family responsible for his crime, a relic of the family unit in government dating back thousands of years. A similar relic is the still-existing law requiring families to care for their members who fall into want.

The trial system brought over by these German tribes was crude. The people were gathered into the "hundred moot," which when grouped formed the "folk moot." Trials took place before these gatherings, but were largely decided upon adherence to form rather than the merits of the case.

William the Conqueror, although a Frenchman, preserved the English law after he conquered the country. He sent judges (Frenchmen) about the country to administer justice, and they, in order to be fair, summoned groups of men, twelve in each, to give them facts. These men were sworn to be truthful, hence the term "jury" from Latin "jurare," to swear. These juries explained the customs of the country to the judges. These first juries (about 1150 A. D.) heard no witnesses.

To permit appeal from the testimony of the juries, grand juries were formed. An adverse decision by a grand jury resulted in the outlawing of the juror involved. Thus formed the grand jury was used also by the judges to report actual or suspected crimes. This in the modern form of reporting indictments is the duty of the grand jury today.

In early days guilt was determined by crude methods. For example, if a suspect could carry a piece of red-hot iron three steps without the burn festering he was judged innocent, and vice versa. If a man could repeat an oath correctly after eating a handful of dry rice he was acquitted. The Normans introduced "trial by battle," in which innocence could be proved by success in tilting with lances.

In the development of the jury trial, say from 1150 to 1250, A.D., laws were passed entitling a defendant to ask for jury trial—"to put himself upon the country" (i. e., the section from which the jury was drawn). This expression is still in use in criminal procedure in this country.

The earliest known collection of English laws found printed was that of King Ethelbert (600 A.D.). These were contained in ninety sentences. Our general laws today occupy two volumes of a total of 2,500 large pages. Each year the Legislature passes law covering 400 to 500 printed pages.

LAW-MAKING IN MASSACHUSETTS

In the State of Massachusetts any citizen can initiate bills, which will be presented to the Legislature if signed by a representative or senator. At the opening of a session of this body, the bills which have been filed with the clerk are referred to appropriate committees of the House of Representatives. There

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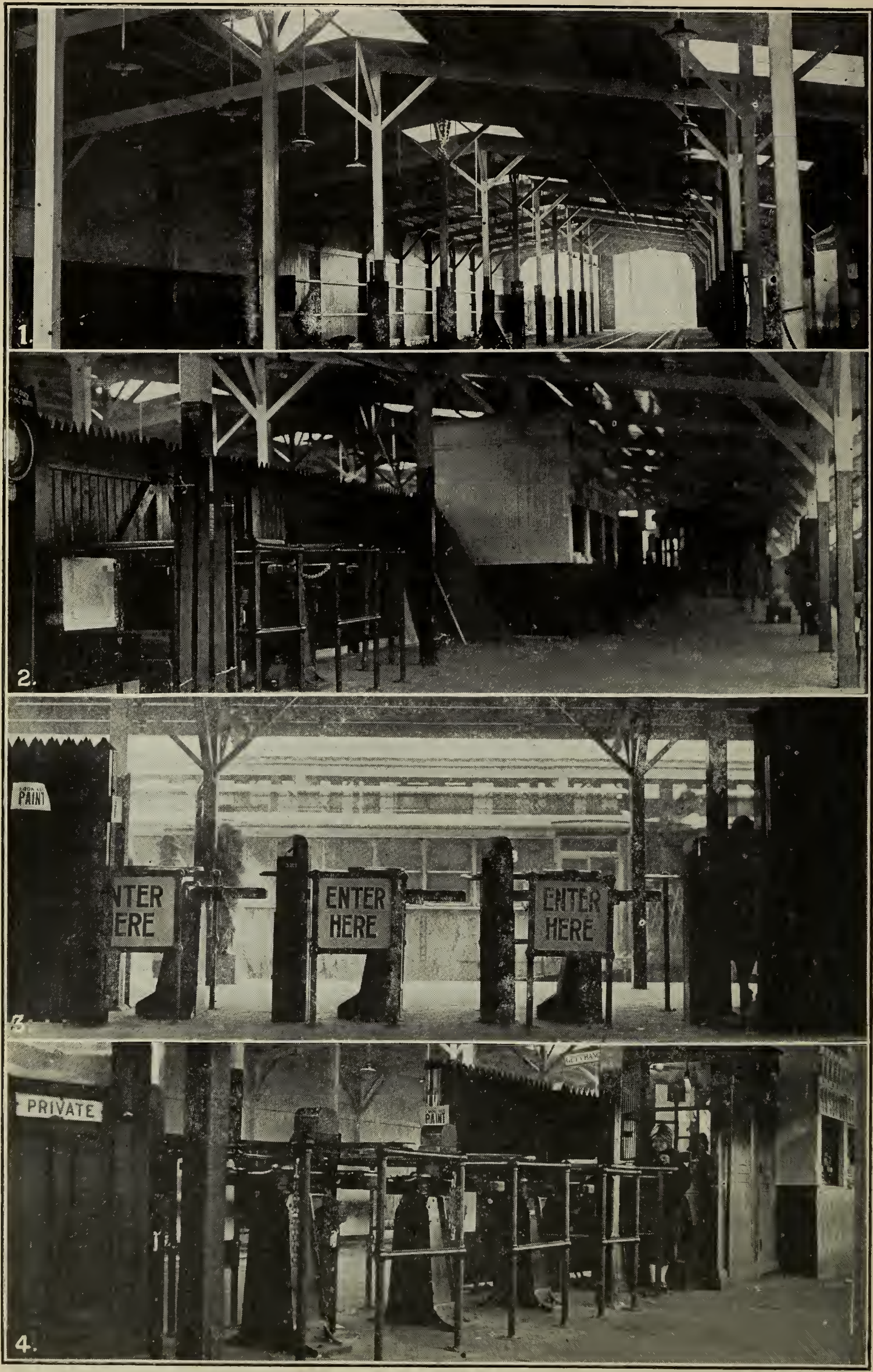
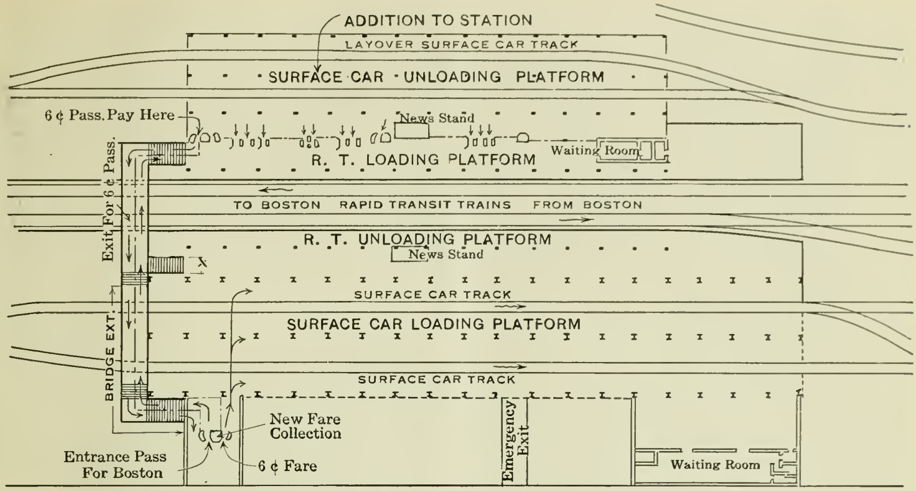
*Abstract of second lecture in Course in Everyday Law. E. M. Brooks, chairman, delivered at Franklin Union and Sullivan Square. Monday, Nov. 21. 1927.

†See issue of "Co-operation" for October, page 173.



GLIMPSES IN THE EVERETT TERMINAL

1—New addition covering two surface-car unloading tracks. 2—Rapid-transit loading platform. 3—Automatic passimeters between surface-car unloading platform and rapid-transit platform. 4—View from rapid-transit loading platform towards surface-car unloading platform.



DETAILS OF STATION ON ENLARGED SCALE

outbound trolley tracks as well. Thus it will no longer be necessary for passengers to cross the two outbound trolley tracks at grade as at present.

The stairway leading from the inbound rapid-transit platform has been widened; and the bridge, together with the stairways at either end, will be divided by a fence, providing two passageways of equal width. One is for riders paying 10 cents, and the other for those paying 6¼ cents. The stairway at the end of the bridge nearest to Broadway terminates in the entrance building.

Fare Collection

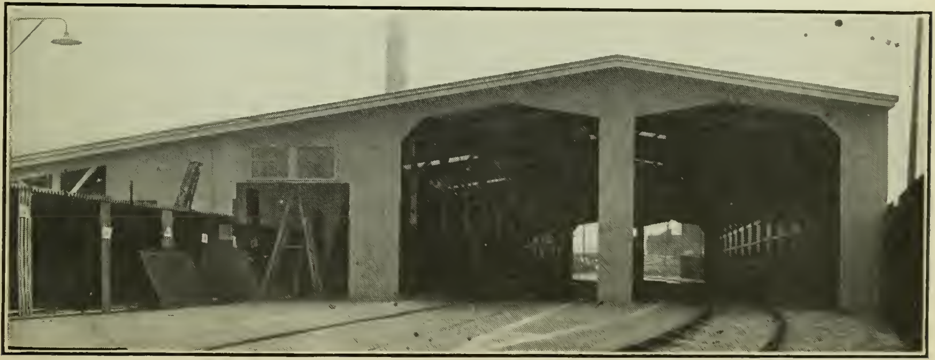
The interior of the entrance building was completely changed by removing the ticket office, the Langslow passimeter, and the double-exit turnstile, and installing a single change booth in the center. On one side of this there will be a Langslow passimeter for passengers paying 6¼ cents, who will enter directly to the platform for surface cars for Everett and Malden. On the other side will be located a Langslow passimeter which will admit passengers paying a 10-cent fare for trains to Boston.

Passengers entering the station on surface cars from Everett or Malden, who pay 6¼ cents, will pass through a Langslow passimeter located at the north end of the surface-car unloading platform and pass directly over the bridge to, and out through, the entrance building to Broadway.

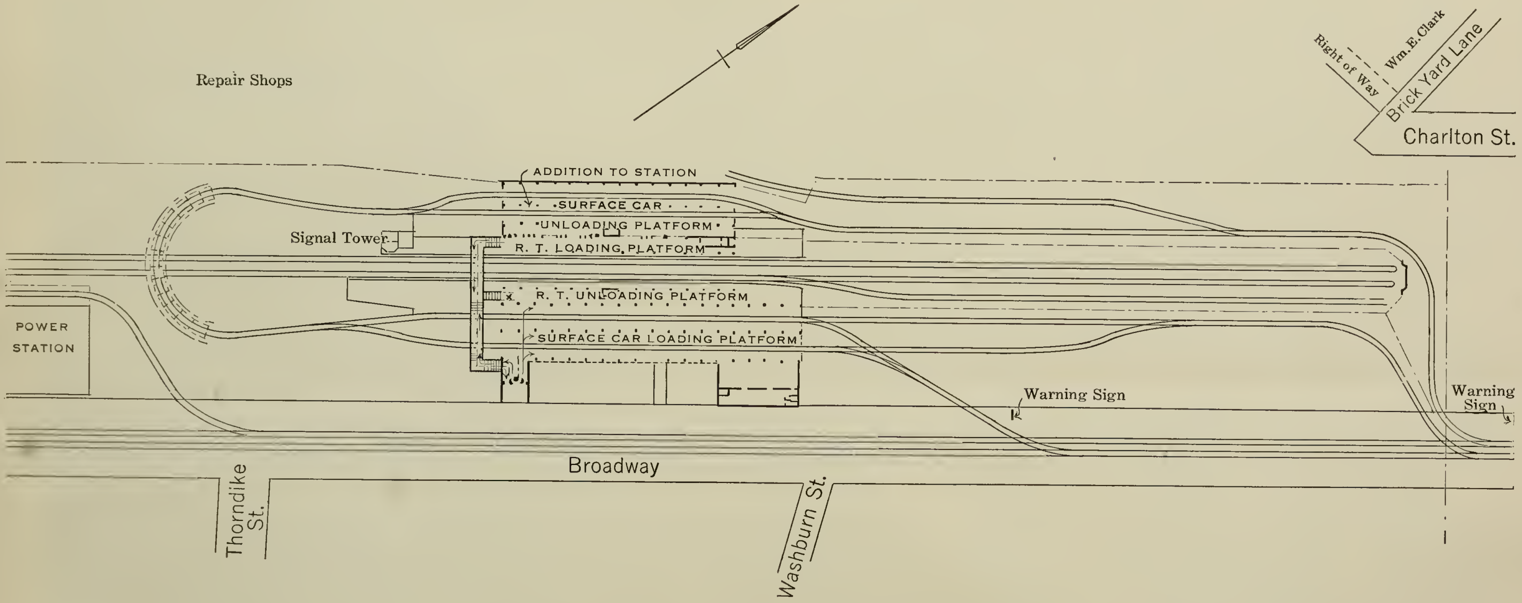
On the inbound rapid-transit platform the present fare-collecting apparatus, consisting of two change booths and five fare boxes, will be removed. In their place there will be installed three change booths, three Langslow passimeters, two fare boxes, and eight General Electric automatic 2-way passimeters.

Fresh Paint

In connection with these changes the station has been put in thorough repair. Both the interior and exterior have been re-painted, the interior with light-colored paint, so that now the entire station presents a fresh and attractive appearance.



SURFACE-CAR TRACKS UNDER STATION ROOF



GENERAL LAYOUT OF THE EVERETT TERMINAL

This diagram, supplemented by the larger scale drawing of the station portion on page 181, and by the accompanying reproduction of construction photographs, will serve to give an accurate picture of the important changes which are about completed at this terminal.

EVERETT TERMINAL IMPROVED

Extensive Remodeling of Station for Convenience and Comfort of Passengers, for More Efficient Collection of Fares, Especially Local Fares, and for General Serviceability, Is Now About Complete

EXTENSIVE changes and additions have just been completed at the Everett Terminal in order to provide better facilities for handling passengers at this important transfer point.

The use of the General Electric dime-in-the-slot 2-way automatic passimeters has proved so successful at other stations, that it was decided to install them here. At the same time, the inbound rapid-transit platform, which has always been rather narrow, was widened from 12 feet to 20 feet.

The inbound surface track has also been relocated, increasing the width of the surface platform from 12 feet to 15 feet, and an additional surface track has been installed with a 12-foot platform between the two tracks.

Passengers Now Transfer Within Station

With two inbound surface tracks in the station trolley cars can now enter the station. This change, together with the automatic passimeters, will permit passengers to change from the trolley cars to the rapid-transit trains with much less annoyance and in much quicker time than heretofore.

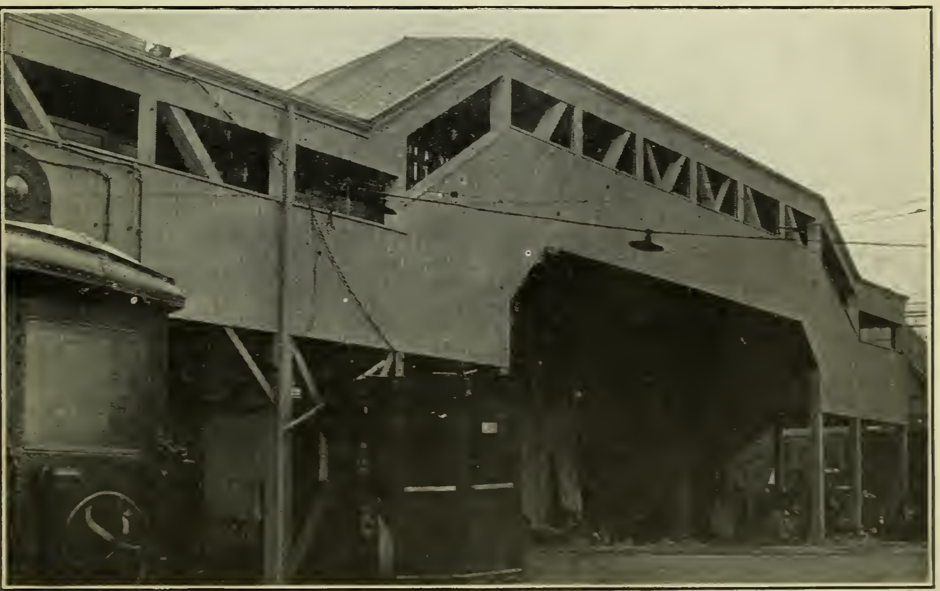
To furnish patrons with better protection from the weather, the canopy over the rapid-transit and surface platform has been extended over both surface tracks and the new surface platform, with a windbreak on the west side. This provides an inbound covered station 65 feet wide and 210 feet long.

This station has also been equipped with ten skylights of large size. This will provide plenty of light without artificial illumination, except at night.

While these changes will no doubt please the public, the improved method of collecting fare at the Broadway entrance will also be appreciated, particularly by the local riders. Formerly, such riders were obliged to board or leave the cars outside the station. This not only required an additional car stop, but passengers in boarding or leaving the cars were obliged to cross automobile traffic, and there was no shelter for passengers waiting for cars outside the station. All of these undesirable conditions will be eliminated by the new facilities.

Bridge Extended

The new arrangement consists of an extension of the bridge over the rapid-transit tracks an additional 65 feet, so that passengers entering or leaving the station from Broadway will pass over the



BRIDGE EXTENSION AT EVERETT TERMINAL

1928

To All 'El' Employees

ANOTHER year is opening before us. This is, therefore, an appropriate time to consider what we can do to make the wheels run smoothly during the coming year.

The following are a few suggestions:

1. We can make an outstanding record in reducing accidents.
2. We can avoid giving patrons cause for complaint.
3. We can take an interest in the adjustment of service to meet the changing traffic requirements.
4. We can conserve time and material.
5. We can do our utmost every day.

MAY the New Year bring Health and Happiness to you and yours.

Edward Dana

1928

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BOSTON ELEVATED RAILWAY

CO-OPERATION

Volume 5 DECEMBER, 1927 Number 12

Boston Elevated Close-Ups

THE CONDUCTOR

(See Page 191)